

Draft Regulation

Petroleum Resources Act
(2016, chapter 35)

Petroleum exploration, production and storage on land

— Making

Notice is hereby given, in accordance with sections 10 and 11 of the Regulations Act (chapter R-18.1), that the Regulation respecting petroleum exploration, production and storage on land, appearing below, may be made by the Government on the expiry of 45 days following this publication.

The draft Regulation sets the conditions for the granting and exercise of the authorizations required for petroleum exploration, production and storage on land, and sets the fees payable. The draft Regulation also determines the protective and safety measures that must be implemented. In addition, it establishes the content of the permanent well or reservoir closure and site restoration plan, the time at which the work planned in the plan must be carried out, and the duration, form and terms of the related guarantee. Lastly, it provides for conditions for the granting and exercise specific to the authorization to produce brine.

Study of the matter shows that the draft Regulation will have an impact on enterprises currently holding rights to explore for and produce petroleum and gas or operate an underground reservoir that will have to obtain authorizations to carry out certain activities that were not regulated, in particular the carrying out of stratigraphic surveys, fracturing and reconditioning. The enterprises will also have to furnish a guarantee representing the totality of the costs for well or reservoir closure and site restoration. They will have to contend with greater accountability, in particular in respect of the information sent to the Minister of Energy and Natural Resources. The additional requirements may impose, in certain cases, a significant burden.

Further information on the draft Regulation may be obtained by contacting Marie-Eve Bergeron, Director, Bureau des hydrocarbures, Ministère de l'Énergie et des Ressources naturelles, 5700, 4^e Avenue Ouest, bureau A-422, Québec (Québec) G1H 6R1; telephone: 418 627 -6385, extension 8131; toll free: 1 800 363 -7233, extension 8131; fax: 418 644 -1445; email: marie-eve.bergeron@mern.gouv.qc.ca

Any person wishing to comment on the draft Regulation is requested to submit written comments within the 45-day period to Luce Asselin, Associate Deputy Minister for Energy and Mines, Ministère de l'Énergie et des Ressources naturelles, 5700, 4^e Avenue Ouest, bureau A-407, Québec (Québec) G1H 6R1.

PIERRE ARCAND,
*Minister of Energy and
Natural Resources and
Minister responsible for the Plan Nord*

Regulation respecting petroleum exploration, production and storage on land

Petroleum Resources Act

(2016, chapter 35, s. 23; ss. 10, 26, 68 to 70, 71, 2nd par., 73, 1st and 2nd pars., 76, 1st and 2nd pars., 78, 1st and 2nd pars, 80, 84, 2nd par., 85, 88, 90, 2nd par., 91, 92, 3rd par., 93, 95, 96, 100, 2nd par., 102, 103, 2nd par., 117, 118, 2nd par., 119, 1st par., 121, 1st par., 122, 2nd and 4th pars., 123, 124, 126, 2nd par., 128, 1st and 3rd pars., 131, 1st par., 191, 207, pars.1 to 3 and 5)

CHAPTER I

GENERAL

1. This Regulation establishes the conditions of exercise of the petroleum exploration, production and storage activities, while ensuring the safety of persons and property, environmental protection, and optimal recovery of the resource.

It applies to activities carried out on land.

2. In this Regulation,

“activity site” means a zone grouping one or more drill holes and the land laid out in the immediate vicinity to receive the equipment and infrastructures necessary for the operations carried out in the drill holes or, in the case of a survey, the zone corresponding to the perimeter of the area of the survey; (*site des activités*)

“actual vertical depth” means the vertical distance from a point in the drill hole to a point on the surface; (*profondeur verticale réelle*)

“annular space” means a space in the shape of a ring between the outside of a casing and the wall of the drill hole or between two casing walls inserted one inside the other; (*espace annulaire*)

“blowout preventer” means all the special valves or other similar mechanical devices, installed between the wellhead and the drill floor, and intended to block, control and monitor the drill hole in the event of a blowout; (*bloc obturateur de puits*)

“casing shoe” means a metal annular part installed at the bottom of a casing string; (*sabot de tubage*)

“casing string” means the entire casing of a drill hole composed of a number of tubing sections generally linked by threaded connections; (*colonne de tubage*)

“completion” means all the work carried out in a well or a section of well to allow its start up once the drilling activities are completed, excluding fracturing; (*complétion*)

“concentration of residential, commercial, industrial or service activities” means the grouping of 5 lots or more on which one or more residential, permanent or seasonal, commercial, industrial or service activities are present, and a lot including 5 residential buildings or more; (*concentration d’activités résidentielles, commerciales, industrielles or de services*)

“conductor casing” means the first casing installed at the time of the construction of a drill hole to prevent the collapse of unconsolidated formations near the surface and to provide structural support for the wellhead equipment and for the subsequent casing strings; (*tubage conducteur*)

“deflector” means a sealing and collection device comprising pipes and valves, placed near the wellhead and used to control a shallow blowout and keep the fluids away from the drill hole; (*déflexeur*)

“directional drilling” means a hole drilled at an angle greater than 10° from vertical; (*forage directionnel*)

“drill hole” means a well or a stratigraphic survey; (*trou de forage*)

“drilling fluid” means the sludge circulating in the drill rod and comes up in the annular space during drilling to remove cuttings, cool and lubricate the bit and maintain the desired pressure in the drill hole; (*fluide de forage*)

“drilling rig” means the equipment used to drill a well which includes in particular a derrick, a winch, a rotary table, a drilling fluid pump, a blowout prevention system, and power, control and monitoring systems; (*appareil de forage*)

“drill-stem test” means an operation for collecting samples of fluids contained in rock to determine flow characteristics and measure reservoir pressures, without modifying the drill hole equipment; (*essai aux tiges*)

“emanation at the surface casing blowhole” means the flow of fluids from the annular space between the surface casing and the internal casing; (*émanation à l'évent du tubage de surface*)

“flow-back water” means water produced by petroleum exploration and production activities that comes up to the surface of the drill hole; (*eau de reflux*)

“flushing fluid” means fluid designed to clean the drill hole and separate the drilling fluids from the cement slurry; (*fluide de chasse*)

“formation fluid” means a fluid in a natural state or injected present in the pores, fractures, faults, caves or other porosities of the formation; (*fluide de formation*)

“fracturing half-length” means the radial distance separating the well from the outside end of a fracture propagated by fracturing; (*demi-longueur de fracture*)

“fracturing test” means a geomechanical survey carried out before the fracturing that allows to anticipate the length of fractures, the reaction of geological units to fracturing and the geological confinement potential of the fracturing fluids by the sealing rock, and to find out at which pressure the rock starts fracturing; (*essai de fracturation*)

“gas migration” means the gas flow detectable on the surface, outside the farthest casing string; (*migration de gaz*)

“guide tube” means a light tube used to prevent the collapse or washout of soft ground near the surface of a drill hole, but is not used to control the well; (*tube guide*)

“horizontal well” means a well whose drill hole angle, from vertical, exceeds 80° and includes a section extended from the drill hole in the reservoir; (*puits horizontal*)

“injection well” means a well used to inject fluids into an underground formation to improve the recovery of the petroleum; (*puits d'injection*)

“injectivity test” means a procedure to determine the rate and pressure at which fluids may be pumped to obtain the permeability of a zone without fracturing the formation; (*essai d'injectivité*)

“integrity” means, in the case of a drill hole, the condition that ensures containment and prevention of a blowout of fluids in the underground or surface formations; (*intégrité*)

“intermediate casing” means a casing installed before reaching the final depth of the drill hole to isolate unstable hole sections, lost circulation zones, overpressured or underpressured zones or production zones; (*tubage intermédiaire*)

“measured depth” means the length of travel of the drill hole; (*profondeur mesurée*)

“miss-fire” means any portion or remainder of a hole containing explosives that have not completely detonated following blasting operations; (*raté*)

“observation well” means a well used to monitor the conditions of one or more geological formations, to determine the decline characteristics of a reservoir or to monitor the other wells of a reservoir, except an observation well for groundwater within the meaning of the Water Withdrawal and Protection Regulation; (*puits d’observation*)

“primary protective barrier” means the first protective barrier of a well constituted of one or more components that, collectively, are designed and installed to contain and isolate fluids inside a well; (*barrière de protection primaire*);

“production casing” means a casing installed to isolate the production zones and provide a duct through which the well is completed and operated; (*tubage de production*)

“production tubing” means a steel tube placed inside casings used as a duct through which fluids are routed from the production zones to the surface or, in the case of an injection well, from the surface to the production zones; (*tube de production*)

“re-entry” means the new drilling in a well already drilled and for which the drilling rig has been released; (*réentrée*);

“seal” means an inflatable device used to close a drill hole or an annular space; (*garniture d’étanchéité*)

“secondary protective barrier” means a second protective barrier designed and installed to ensure a protection and allow control of the well in the event of a mechanical failure of the primary protective barrier; (*barrière de protection secondaire*)

“spacer fluid” means any liquid used to physically separate a liquid or a specific use component from another; (*fluide de séparation*)

“surface casing” means a steel casing in a competent formation after the installation of the conductor casing to prevent the walls from collapsing and protect against underground water contamination; (*tubage de surface*)

“surface improvement work for sporting or recreational purposes” means a bicycle or cross-country ski trail, a snowmobile trail, a downhill skiing centre, a golf course, a baseball or soccer field, or any other facility of that type intended for sporting or recreational purposes; (*ouvrage d’amélioration de la surface à des fins sportives ou récréatives*)

“temporary interruption” means the interruption of work for a short period between 2 activities or 2 operations; (*interruption provisoire*)

“usable groundwater” means groundwater whose total concentration in dissolved solids is less than 4,000 mg / l; (*eau souterraine exploitable*)

“well logging” means measurement or recording based on the depth of a characteristic of a geological formation carried out from a drill hole; (*diagraphie*)

“wellhead” means a device installed between the top part of the surface casing and the blowout preventer during the construction phase of the drill hole; it also includes the coil, valve and adaptor system that controls the pressure in a drill hole; (*tête de puits*)

“wellhead value” means the average retail sale price of the substance extracted, excluding all taxes and less the average transportation costs from the well to the places of delivery, measuring costs and, if applicable, purification costs. (*valeur au puits*)

3. For the purposes of this Regulation, the base of the usable groundwater is set at 200 m below the surface, unless a hydrogeological study or an analysis of an adjacent drill hole shows that the deepest base of the aquifer of the usable groundwater is located at a different depth.

4. All documents that must be sent to the Minister under this Regulation must also be sent in an electronic version, in PDF, excluding well logging raw data that must be in ASCII files. The maps produced by a geoscience information system software must be sent in a shapefile or in PDF.

5. The measurement units in the documents required under this Regulation must be expressed according to the International System (SI).

CHAPTER II

SAFETY AND PROTECTIVE MEASURES AND INCIDENT NOTICE

DIVISION I

SAFETY AND PROTECTIVE MEASURES

6. A licence holder ensures that there is a sufficient number of qualified persons and that the persons have received the training needed to successfully complete the activities planned safely and in a manner to protect the environment.

7. A licence holder must ensure that the equipment and components on the activity site are

(1) in good condition and used for the purposes specified, in accordance with the requirements of the manufacturer;

(2) free from any alteration that may endanger the safety of persons and property, and environmental protection; and

(3) entered in a list that is updated and kept on the activity site.

8. A licence holder must ensure that the equipment, vehicles and machinery are cleaned before their mobilization on the activity site.

9. A licence holder must ensure that adequate procedures and equipment are in place to

(1) verify and control the pressures to which the equipment is submitted during the activities;

- (2) detect a liquid flow, or a gas emanation or migration; and
- (3) control at all times a drill hole.

10. In the case of a loss of control of a drill hole, a licence holder must close the valves of all other drill holes of the activity site until the drill hole is again under control.

11. A licence holder must install a communication and information exchange system that ensures,

(1) during a change of shift, the transmission of any information pertaining to the conditions and mechanical or operational problems likely to have an impact on the safety of persons and property, and environmental protection;

(2) that every person on the activity site is familiar with the safety instructions and evacuation procedures in an emergency; and

(3) that every person responsible for a measure under the emergency response plan provided for in subparagraph 4 of the second paragraph of section 25 is familiar with the system.

12. A licence holder must ensure that the fuel, chemical substances related to safety, drilling fluids, cement and other consumables necessary for carrying out the activities under way are easily accessible and stored on the activity site in a quantity sufficient to meet the needs of any emergency situation normally foreseeable.

The licence holder must also ensure that the products used for all work, including explosives, fuel, chemical substances and drilling fluids are stored, handled and transported so as to prevent their deterioration and to ensure the safety of persons and property, and environmental protection.

13. A licence holder must also ensure that the residual materials from the activities are stored, handled, transported, treated and disposed of so as to ensure the safety of persons and property, and environmental protection.

The licence holder also ensures that the activities are carried out so as to reduce to a minimum the production of residual materials.

14. A licence holder must, for the activities following the cementing of the surface casing, use a biocide treatment on the fluids injected in a drill hole to reduce the action of microorganisms and prevent corrosion by hydrogen sulfide (H₂S).

The Minister may exempt the holder from that requirement if the holder demonstrates that there is no risk of bacterial corrosion.

15. Smoking is prohibited on the activity site, except in locations designated for that purpose by a licence holder.

16. A licence holder must ensure that the activity site and access roads are kept in good condition and that no danger results from the layout of the equipment and installations.

The activity site must also be laid out and maintained so that it is accessible at all times to the emergency teams.

17. A licence holder must secure the drill hole and the activity site during a temporary interruption of activities in order to ensure the safety of persons and property, and environmental protection.

During the temporary interruption, the holder must use a wellhead that must be closed, unless the drill hole is cased over its entire length and has not been perforated.

18. Where a well poses a risk for the safety of persons and property, and environmental protection, a licence holder must carry out corrective activities in compliance with Chapter X.

A well is considered to pose a risk if any of the following situations is detected:

(1) there is an emanation at the surface casing blowhole and that emanation has one of the following characteristics:

- (a) its stabilized flow is equal to or greater than 50 m³ / day;
- (b) the emanation is not only composed of gas;
- (c) it contains hydrogen sulfide (H₂S) whose concentration is equal to or greater than 6 µg/m³ for 4 minutes;
- (d) it is produced by a failure of a seal or casing;

(2) the stabilized closing pressure at the wellhead is equal to or greater than half the fracturing pressure measured at the elevation of the surface casing shoe or, if that elevation is unknown, at 11 kPa/m multiplied by the actual vertical depth of the surface casing.

(3) there is a gas migration that represents a fire hazard or a risk to the safety of persons and property, and environmental protection.

19. Where a licence holder uses a wellhead, that wellhead must comply with CSA Standard Z625, Well design for petroleum and natural gas industry systems, except a storage wellhead that must comply with CSA Standard Z341, Storage of hydrocarbons in underground formations, published by the Canadian Standards Association.

DIVISION II

INCIDENT NOTICE

20. A licence holder must immediately notify the Minister where any of the following incidents occurs:

- (1) damage to the integrity of a drill hole;
- (2) a casing corrosion problem;

- (3) an unexpected loss of pressure in a drill hole;
- (4) the detection of hydrogen sulfide (H₂S);
- (5) an accidental blowout or emission;
- (6) liquid flow;
- (7) the detection of any of the situations provided for in the second paragraph of section 18;
- (8) a fire or an explosion;
- (9) an accidental spill;
- (10) vandalism;
- (11) the triggering of the emergency response plan provided for in subparagraph 4 of the second paragraph of section 25;
- (12) damage to private property;
- (13) ground movement;
- (14) any other event likely to have an impact on the safety of persons and property, or environmental protection.

The notice must contain the corrective measures taken by the holder or those planned with their schedule.

In the case of a corrosion problem, the holder must inform the Minister of the type of corrosion, the depth interval and the cause.

In the case of a blowout, the holder must inform the Minister of the depth, volume, duration and density of the drilling fluid necessary to control the drill hole.

In the case of damage to private property, the licence holder must also notify the owner.

21. After having received an incident notice under section 20, the Minister may require that the licence holder send to the Minister an event report stating the facts, evaluating the consequences, listing possible causes and proposing mitigation measures and measures to prevent reoccurrence of the event.

CHAPTER III

PROVISIONS SPECIFIC TO ACTIVITY AUTHORIZATIONS AND APPROVALS

22. A licence holder must ensure that all depth measurements are taken from a single reference point. The holder must always indicate the reference point from which those measurements are taken.

23. A licence holder applying for an authorization or an approval for an activity must, in the application submitted to the Minister, demonstrate that the planned work will be carried out according to generally recognized best practices to ensure the safety of persons and property, environmental protection and the optimal recovery of the resource.

24. A licence holder must keep a copy of authorizations and approvals on the activity site for the work period.

25. The application for authorization or approval of an activity, except the authorization for geochemical surveying and the approval of the enhanced petroleum recovery project, must be accompanied by a safety and community involvement program detailing elements likely to have an impact on the safety of persons and property.

The safety and community involvement program must include, in particular,

- (1) a plan at a scale of 1:500 showing the layout of the activity site, including, in particular,
 - (a) the dimensions of the site;
 - (b) access roads;
 - (c) the actual or proposed location of the collar of the drill hole covered by the authorization or approval application; and
 - (d) existing or proposed storage equipment, installations, infrastructures and basins;
- (2) a description of the mitigation measures anticipated to harmonize the use of the territory and minimize disruptions for the local communities;
- (3) an emergency response plan compliant with CSA Standard Z731, Emergency Preparedness and Response, published by the Canadian Standards Association;
- (4) a plan for communication with the local communities revised by the monitoring committee;
- (5) an estimate of the economic benefits for the region; and
- (6) any other information or document requested by the Minister.

For the application for a geophysical surveying authorization, the safety and community involvement program must also include a schedule of the road traffic, indicating the volume of trucking and the period during which it will take place and a map showing routes. However, it does not have to include the elements provided for in subparagraphs 1 and 3 of the second paragraph.

CHAPTER IV MEASUREMENT

26. A licence holder ensures that the rate of flow and the volume of the following fluids are measured:

- (1) the fluid extracted from a well;
- (2) the fluid injected into and withdrawn from a well;
- (3) the fluid that enters, leaves, is used or is flared, vented, burned or disposed of in an installation.

The measurements recorded must be expressed at a temperature of 15° C and a pressure of 101.325 kPa.

27. A licence holder ensures that the measurements are taken in accordance with the flow system, flow calculation procedure and flow allocation procedure.

The term “flow system” means the flow meters and auxiliary equipment attached to the flow meters, fluid sampling devices, production test equipment, the master meter and meter prover used to measure and record the rate and volumes at which fluids are

- (1) produced from a pool or withdrawn from an underground reservoir;
- (2) injected into a pool or stored in an underground reservoir;
- (3) used as a fuel;
- (4) used for artificial lift; or
- (5) flared or transferred from an installation.

28. A licence holder must notify the Minister at least 15 days before the calibration of a meter prover or a master meter.

A copy of the calibration certificate is sent to the Minister within 7 days following the calibration.

29. A licence holder who mixes fluids from a well or a group of wells must, 30 days before measuring the production flow of the pool, notify the Minister of the method, the frequency and the duration of the measurements, indicating the manner in which the total production of each of the mixed fluids will be allocated to each of the wells.

30. Where a well goes through a number of pools or formations, a licence holder ensures that the production of each pool or formation is allocated and the injection into each pool and each formation is allocated.

CHAPTER V**GEOPHYSICAL OR GEOCHEMICAL SURVEYING AUTHORIZATION****DIVISION I****AUTHORISATION FOR GEOPHYSICAL SURVEYING****§1.** *Conditions for obtaining an authorization*

31. A licence holder who wishes to obtain a geophysical surveying authorization must apply to the Minister, in writing, at least 30 days before starting the work.

If the surveying involves line cutting, the application must be submitted to the Minister at least 60 days before starting the work.

32. The application must contain

- (1) the name and contact information of the holder and the licence number; and
- (2) the work schedule and an estimate of the realization costs.

33. The application must be accompanied by

- (1) the demonstration that the separation distances provided for in section 40 are complied with;
- (2) a topographic map at a sufficient scale showing, in particular,
 - (a) the perimeter of the licence;
 - (b) the territories of the municipalities in which surveying is conducted;
 - (c) the roads comprised in the perimeter of the licence;
 - (d) the activity site and the survey lines, and the traverses with their nature, numbering and length;
 - (e) the points of energy source and their numbering;
 - (f) public and private land;
 - (g) if applicable, the existing line cutting up to 400 m from the activity site;
 - (h) if applicable, the campsite or the helicopter platform; and
 - (i) in the case of an aerial survey, the flight plan;
- (3) the geophysical surveying technical program provided for in section 33 signed and sealed by a geologist or an engineer;

- (4) payment of the fee of \$1,030; and
- (5) any other information or document requested by the Minister.

If required and based on the area of the surveying, the licence holder may, for the purposes of subparagraph 2 of the first paragraph, submit a number of maps at different scales.

34. The geophysical surveying technical program must include

- (1) the name and contact information of the geologist or the engineer responsible for the program;
- (2) the name, profession and functions of the persons who prepared or revised the program;
- (3) the name and contact information of the enterprises charged with carrying out the data acquisition, processing and interpretation work;
- (4) the name of the region in which the surveying will be conducted;
- (5) a description of the geological context and the degree of maturity of the exploration in the territory concerned;
- (6) the type of the proposed surveying and the energy source used;
- (7) the objectives of the surveying including, in particular, the acquisition parameters, the structures, the geological formations targeted and the investigation depth;
- (8) the area covered by the surveying or the total number of linear kilometres to be surveyed;
- (9) the coordinates of the ends of each survey line or the activity site according to the NAD83 map reference system;
- (10) the required flexibility margin on either side of the survey line for positioning the lines indicated on the map;
- (11) the method used to determine the location of the lines;
- (12) a chronological and detailed description of the work to be carried out;
- (13) the time at which the work will be carried out;
- (14) a description of the equipment to be used;
- (15) in the case of a surveying involving an explosive energy source,
 - (a) a description of the training or certificates of the workers who will load explosives in the shot holes and fire them; and
 - (b) the type of explosive substance and the charge, in kilograms, to be detonated; and

(16) in the case of a surveying involving the drilling of a shot hole, the depth and method of sealing the hole.

§2. *Time periods and notice of the start of the work*

35. The authorization holder must, within 12 months after the Minister granted the authorization, start the geophysical surveying work.

The work is deemed to have started as soon as the first step provided in the work schedule is initiated.

The Minister may grant an additional time period for carrying out the surveying if the holder demonstrates the need therefor.

36. The authorization holder must, at least 7 days before the start of the work, notify the Minister of the date anticipated for the start of the work.

Where the holder cannot comply with the date, the holder must as soon as possible notify the Minister, in writing, indicating the reasons justifying the delay. The holder must also notify the Minister, in writing, of the new expected date for the start of the work if the date is expected within 7 days of the first notice of delay or of the holder's intent not to proceed.

37. The authorization holder must, at least 24 hours before, notify the Minister of the work completion date if the geophysical surveying work is completed or temporarily interrupted, and in the latter case, the holder must also notify the Minister of the work resumption date.

§3. *Conditions of exercise*

38. The authorization holder must comply with the technical program.

The holder may modify the program by sending to the Minister a supplementary agreement signed and sealed by a geologist or an engineer stating the nature of the modification and the reasons justifying it. The supplementary agreement must be sent to the Minister before carrying out the work covered by the agreement. If it is urgent to modify the technical program for safety or work quality purposes, the holder must immediately send the agreement to the Minister and justify the urgency.

A supplementary agreement to the technical program is not required in the following cases:

(1) a change in the position of survey lines, as long as the position remains within the flexibility margin set under paragraph 10 of section 34;

(2) the cancellation of the drilling or loading of a shot hole.

In the situations provided for in the third paragraph, the holder immediately notifies the Minister of the change to the technical program.

39. The authorization holder must, during the work, install a sign on each mobile equipment, excluding aircrafts, indicating

- (1) the holder's name and the licence number;
- (2) the number of the geophysical surveying authorization; and
- (3) the type of surveying carried out.

40. The authorization holder who uses an explosive energy source must not position the shot holes in the right of way of a public highway within the meaning of the Highway Safety Code (chapter C-24.2), a multi-purpose road within the meaning of the Sustainable Forest Development Act (chapter A-18.1), a mining road within the meaning of the Mining Act (chapter M-13.1) and a road within the meaning of section 138 of the Petroleum Resources Act (2016, chapter 35, s. 23). The holder must also not position them

- (1) less than 10 m from a survey marker or a pipe that is not made of concrete;
- (2) less than 15 m from a buried telecommunication infrastructure or any other buried installation or infrastructure of the same type or a wastewater treatment system and a holding tank;
- (3) less than 30 m from a railway;
- (4) less than 32 m from a pipeline or another installation or infrastructure of the same type, the collar of an existing drill hole or, if the charge exceeds 2 kg, less than a distance corresponding to the following formula:

$$A + B \times 4 = C \text{ where}$$

A is 32 m

B is the explosive charge, in kg

C is the minimum separation distance;

- (5) less than 100 m from a cemetery;
- (6) less than 180 m from a building with a concrete foundation or a concrete pipe if the explosive charge does not exceed 12 kg;
- (7) less than 180 m from a high-capacity dam, within the meaning of the Dam Safety Act (chapter S-3.1.01);
- (8) less than 200 m from a site for withdrawing water for the purposes of human consumption or food processing or from a transmission line having a voltage equal to or greater than 69,000 V; or
- (9) less than 200 m from a building with a concrete foundation or a concrete pipe, if the explosive charge exceeds 12 kg.

The authorization holder who uses a non-explosive energy source at the surface must not position the energy source

- (1) less than 2 m from a buried telecommunication infrastructure or any other buried installation or infrastructure of the same type;
- (2) less than 10 m from a survey marker or a pipe that is not made of concrete;
- (3) less than 15 m from a pipeline or other installation or infrastructure of the same type, the collar of an existing drill hole, a wastewater treatment system and a holding tank or a railway;
- (4) less than 50 m from a cemetery, a building with a concrete foundation, a concrete pipe or a high-capacity dam within the meaning of the Dam Safety Act; or
- (5) less than 200 m from a transmission line having a voltage equal to or greater than 69,000 V.

The distances must be measured horizontally, in a straight line, from each energy source to the nearest point of the elements referred to in the first and second paragraphs.

If the individual points of the energy source cannot be located precisely, the minimum distances must be measured from the survey line to the nearest point of the elements referred to in the first and second paragraphs.

The Minister may allow the reduction of the distances if the authorization holder demonstrates to the Minister that an effective protective measure reduces risks.

41. An authorization holder must not drill a shot hole at a depth greater than 12 m.

The holder must not use an explosive charge greater than 20 kg in a shot hole.

42. Where a surveying requires drilling, the authorization holder must protect usable groundwater and use non-toxic substances when drilling and sealing shot holes.

43. Where a surveying involves an explosive energy source, the authorization holder keeps and maintains, until the end of the blasting operations, a register of all the numbers of the holes drilled and of those loaded with explosives.

44. The authorization holder must ensure that a hole loaded with explosives is monitored until

- (1) the collar is packed with drill cuttings, bentonite or an equivalent material;
- (2) a survey post marking the location and indicating the surveying authorization number is installed;
- (3) the wire connected to the explosive charge is solidly attached on the surface and the excess wire is rolled around the survey post; and
- (4) the remaining drill cuttings are levelled uniformly around the shot hole.

45. The authorization holder must comply with the following firing procedure:

- (1) before proceeding with the firing, the person responsible for the blasting must ensure that the persons present have taken shelter;
- (2) the following sound signals must be emitted with a siren of at least 120 decibels:
 - (a) immediately before blasting, 12 short horn signals at one-second intervals;
 - (b) 30 seconds must elapse between the last warning signal and the time of firing;
 - (c) after blasting, once the blasting area is safe, one continuous 15-second horn signal must announce that work may be resumed in the area;
- (3) the person responsible for the blasting must make sure that workers take shelter outside the blasting area before the first signal and that they remain there until the 15-second signal is sounded;
- (4) a code of sound signals reserved for blasting operations must be written in coloured letters 150 mm high, against a contrasting background, on a board 1.2 m high by 2.4 m wide, placed at all points of access to the blasting site.

46. Any explosive charge that misfired must not be extracted, but must be blasted again during the same work shift.

During the repriming or refiring, the authorization holder must make sure that

- (1) the untamping of the collar is done by the person who loaded and fired the shot hole, unless the person is unable to do so;
- (2) during all untamping, repriming and firing operations, only the person responsible for the operations is present in the blasting area; and
- (3) the material used for untamping and the shot hole and inserted in it is made of non-ferrous materials.

If dynamite has been used as explosive charge, it is prohibited to untamp a shot hole unless a tamping plug is placed between the explosive charge and tamping at the time the shot hole is loaded. The tamping plug must consist of paper or any other solid non-ferrous material, have a thickness of 100 mm, brightly-coloured and contrasting with the colour of the packaging of the explosive and the tamping used. During untamping of a shot hole, the tamping plug and the explosives must not have been subjected to stress or shock. When the tamping plug is reached, untamping must be stopped; a primer must then be placed on the contact of the tamping plug and the hole must be restemmed.

If the repriming or refiring operation is impossible, the explosives that are not dynamite must be extracted in accordance with a procedure drawn up by an engineer, taking into account the types of explosives and the manufacturer's instructions and the physical environmental conditions. The procedure must be kept at all times on the activity site.

47. Where, during drilling or the blasting of a shot hole, groundwater flows to the surface or where the presence of gas is detected, the authorization holder must

- (1) interrupt the work in progress;
- (2) make sure that no explosive charge is placed in adjacent shot holes; and
- (3) seal the shot hole so that the fluid is confined in its initial zone.

The holder must obtain the Minister's authorization to continue drilling work. The holder must move or reduce the depth of the drilling of adjacent shot holes to prevent new groundwater flows to the surface or another detection of gas.

48. In the case of surveying involving an explosive energy source, the authorization holder must, immediately after the firing,

- (1) cut the excess of the wire connected to the charge detonated at ground level or in the shot hole;
- (2) seal the shot hole by tamping, up to the surface, at least 1 m of drill cuttings or equivalent material; and
- (3) level the remaining drill cuttings around the shot hole.

If the ground around the shot hole collapsed, the holder must put the site back to its initial level. The backfill material must be of the same type as the soil.

49. The authorization holder must collect all residual materials, facilities and equipment, and restore the activity site as soon as the work ends or as soon as the meteorological conditions allow.

§4. *Daily report and completion report*

50. The authorization holder must draw up a daily report of the work and keep it on the activity site.

The daily report must contain all the elements applicable to the declared day, in particular,

- (1) the number of the geophysical surveying authorization;
- (2) the type of surveying carried out and the energy source used;
- (3) a description, in chronological order, of the work carried out and the time required to carry out each step of the work;
- (4) the number of the lines or traverses in which the data was acquired;
- (5) the number of linear kilometres acquired or the area covered, their total and the remaining quantity;
- (6) work interruptions and disturbances due, in particular, to meteorological conditions and technical and operational difficulties, and their duration;

- (7) the operational problems encountered and the corrective measures taken or planned; and
- (8) any other information or document deemed necessary by the Minister.

51. The authorization holder must send to the Minister, every Monday, the daily reports of the preceding week until the end of the work. If the Monday is a holiday, the report is sent on the first working day that follows.

52. The authorization holder must send to the Minister, within the period provided for in section 100 of the Act, a completion report signed by a geologist or an engineer including, in particular,

- (1) the number of the geophysical surveying authorization;
- (2) the name and contact information of the holder and the licence number;
- (3) the name and contact information of the geologist or engineer responsible for the technical program;
- (4) the name of the enterprises that took part in the work and the nature of the work;
- (5) the number of employees who took part in the work and their positions;
- (6) the name of the region in which the surveying was carried out;
- (7) the type of surveying carried out and the energy source used;
- (8) the purposes of the surveying including, in particular, the acquisition parameters, structures, geological formations targeted, the type of play and the investigation depth;
- (9) the total number of linear kilometres acquired or the area covered by the surveying;
- (10) the start and end dates of the work;
- (11) the summary of the work carried out in chronological order;
- (12) a compilation of the daily progress of the work;
- (13) a topographic map at a sufficient scale showing
 - (a) the perimeter of the licence;
 - (b) the activity site, survey lines and traverses with their nature, numbering and length;
 - (c) the points of energy source and their numbering; and
 - (d) the roads included in the perimeter of the licence;

- (14) a description of the data acquisition parameters indicating, in particular,
 - (a) the spacing between the points of the energy source, the receiver points and, if applicable, between the survey lines;
 - (b) the characteristics of the energy source used; and
 - (c) the setting of the recording filters;
- (15) a description of the data processing parameters;
- (16) the adjustments made to the data during the interpretation;
- (17) the following interpretation maps:
 - (a) in the case of seismic reflection surveying, the isochrone time structure map of the main target and, if applicable, the secondary target and the interpreted profiles; if the stratigraphy of an adjacent drill hole is known, the holder must carry out the blocking of the seismic profile nearest to the hole and indicate the correlation between the main reflectors and the stratigraphy;
 - (b) in the case of seismic refraction surveying, the velocity map;
 - (c) in the case of magnetic surveying, the map for the total magnetic field corrected and offset and the map for the residual magnetic field corrected and offset;
 - (d) in the case of gravimetric surveying, the maps of Bouguer anomalies and of the residual field;
 - (e) in the case of spectrometric surveying, a map of the natural petroleum spill areas on the surface and, if applicable, a map of the anomalies in potassium, uranium and thorium;
 - (f) in the case of electrical resistivity surveying, a map or a profile of the apparent resistivity including, if applicable, faults, the depth of zones and their thickness;
- (18) an analysis of each of the interpretation maps specifying the correlation between the geology and the geophysical data;
- (19) if applicable, the technical reports drawn up by the enterprises that carried out the data processing or interpretation;
- (20) a comparative analysis of the work carried out compared with that planned in the technical program and the results obtained compared with those anticipated;
- (21) a description and photographs of the equipment used and their specifications;
- (22) in the case of a surveying involving an explosive energy source, the coordinates of all misfirings according to the NAD83 map reference system and a description of the corrective measures taken;

(23) in the case of a surveying involving the drilling of a shot hole, the coordinates of the holes in which there is a groundwater spill on the surface or a detection of gas according to the NAD83 map reference system and a description of the corrective measures taken; and

(24) the recommendations for the continuation of the work.

If required and based on the area of the surveying, the holder may, for the purposes of subparagraph 13 of the first paragraph, submit a number of maps at different scales.

§5. *Notice to the Minister*

53. The authorization holder must, within 24 hours, notify the Minister where a firing has misfired.

The notice must indicate the corrective measures taken by the holder or those planned with their schedule.

54. After having received a notice under section 53, the Minister may require from the authorization holder that the holder submits an event report stating the facts, evaluating the consequences, listing possible causes and proposing mitigation measures and measures to prevent reoccurrence of the event.

SECTION II
GEOCHEMICAL SURVEYING AUTHORIZATION

§1. *Conditions for obtaining an authorization*

55. A licence holder who wishes to obtain a geochemical surveying authorization must apply to the Minister, in writing, at least 30 days before the start of the work.

56. The application must contain

- (1) the name and contact information of the holder and the licence number; and
- (2) the work schedule and an estimate of the realization costs.

57. The application must be accompanied by

- (1) a topographic map at a sufficient scale showing, in particular,
 - (a) the perimeter of the licence;
 - (b) the activity site;
 - (c) the sampling points; and
 - (d) public and private land;
- (2) the geochemical surveying technical program provided for in section 58 signed and sealed by a geologist or an engineer;

- (3) payment of the fee of \$1,030; and
- (4) any other information or document requested by the Minister.

If required and based on the area of the work, the licence holder may, for the purposes of subparagraph 1 of the first paragraph, submit a number of maps at different scales.

58. The geochemical surveying technical program must contain

- (1) the name and contact information of the geologist or the engineer responsible for the program;
- (2) the name, profession and functions of the persons who prepared or revised the program;
- (3) the name and contact information of the enterprises charged with carrying out the data acquisition, processing and interpretation work;
- (4) the name of the region in which the surveying will be carried out;
- (5) a description of the geological context and the degree of maturity of the exploration in the territory concerned;
- (6) the type of surveying proposed;
- (7) the purposes of the surveying including, in particular, the acquisition parameters and the type of analyses planned;
- (8) a chronological and detailed description of the work to be carried out;
- (9) the area covered by the surveying;
- (10) the number of samples and the expected percentage of loss;
- (11) the spacing interval between the sampling points;
- (12) the depth of the sample collection; and
- (13) the sampling, collection, transportation and analysis protocol.

§2. *Time periods and notice of the start of the work*

59. The authorization holder must, within 12 months after the Minister granted the authorization, start the geochemical surveying work.

The work is deemed to have started as soon as the first step provided in the work schedule is initiated.

The Minister may grant an additional time period for carrying out the geochemical surveying if the holder demonstrates the need therefor.

60. The authorization holder must, at least 7 days before the start of the work, notify the Minister of the date anticipated for the start of the work.

Where the holder cannot comply with the date, the holder must as soon as possible notify the Minister, in writing, indicating the reasons justifying the delay. The holder must also notify the Minister, in writing, of the new expected date for the start of the work if the date is expected within 7 days of the first notice of delay or of the holder's intent not to proceed.

61. The authorization holder must, at least 24 hours before, notify the Minister of the work completion date if the geochemical surveying work is completed or temporarily interrupted, and in the latter case, the holder must also notify the Minister of the work resumption date.

§3. *Conditions of exercise*

62. The authorization holder must comply with the technical program.

The holder may modify the program by sending to the Minister a supplementary agreement signed and sealed by a geologist or an engineer stating the nature of the modification and the reasons justifying it. The supplementary agreement must be sent to the Minister before carrying out the work covered by the agreement. If it is urgent to modify the technical program for safety or work quality purposes, the holder must immediately send the agreement to the Minister and justify the urgency.

A supplementary agreement to the technical program is not required in the following cases:

- (1) an adjustment in the position of the sampling points;
- (2) a variation in the quantity of sampling points.

In the situations provided for in the third paragraph, the holder immediately notifies the Minister of the change to the technical program.

63. The authorization holder must, during the work, install a sign on each mobile equipment indicating, in particular,

- (1) the holder's name and the licence number;
- (2) the number of the geochemical surveying authorization; and
- (3) the type of surveying carried out.

64. The authorization holder who plans on leaving samples on the surveying site must make sure to protect the integrity of the data, facilities and equipment.

65. The authorization holder must restore the activity site as soon as the work ends or as soon as the meteorological conditions allow.

§4. *Daily report and completion report*

66. The authorization holder must draw up a daily report of the work and keep it on the activity site

The daily report must contain all the elements applicable to the declared day, in particular,

- (1) the number of the geochemical surveying authorization;
- (2) the type of surveying carried out;
- (3) a description, in chronological order, of the work carried out and the time required to carry out each step of the work;
- (4) the numbers of the sampling points and data acquisition modules, their depths and their GPS coordinates;
- (5) if applicable, the discovery of a natural seepage;
- (6) work interruptions and disturbances due in particular to meteorological conditions and technical and operational difficulties, and their duration;
- (7) the operational problems encountered and the corrective measures taken or planned; and
- (8) any other information or document deemed necessary by the Minister.

67. The authorization holder must send to the Minister, every Monday, the daily reports of the preceding week until the end of the work. If the Monday is a holiday, the report is sent on the first working day that follows.

68. The authorization holder must send to the Minister, within the period provided for in section 100 of the Act, a completion report signed by a geologist or an engineer including, in particular,

- (1) the number of the geochemical surveying authorization;
- (2) the name and contact information of the licence holder and the licence number;
- (3) the name and contact information of the geologist or engineer responsible for the technical program;
- (4) the name of the enterprises that took part in the work and the nature of the work;
- (5) the number of employees who took part in the work and their positions;
- (6) the name of the region in which the surveying was carried out;
- (7) the type of surveying carried out;
- (8) the purposes of the surveying including, in particular, the acquisition parameters and the type of analyses;
- (9) the number of samples collected and the percentage of actual loss;
- (10) the depth of the sample collection;

- (11) the area covered by the surveying;
- (12) the start and end dates of the work;
- (13) the summary of the work carried out in chronological order;
- (14) a compilation of the daily progress of the work;
- (15) a topographic map at a sufficient scale showing, in particular,
 - (a) the perimeter of the licence;
 - (b) the activity site;
 - (c) the numbered sampling points; and
 - (d) private and public land;
- (16) the list of the numbered sampling points and their GPS coordinates;
- (17) a description of the data processing parameters;
- (18) an interpretation map for gas sampling showing the spatial variation of the distribution of the gas concentrations showing anomalies;
- (19) an analysis of the interpretation map specifying the correlations between the geology and the geochemical data;
- (20) if applicable, the technical reports drawn up by the enterprises that carried out the data processing or interpretation;
- (21) a comparative analysis of the work carried out compared with that planned in the technical program and the results obtained compared with those anticipated;
- (22) if applicable, the interpretation of the results obtained in connection with the other geological and geophysical data available;
- (23) if applicable, the type of petroleum anticipated in the targets identified by the surveying;
- (24) if applicable, the discovery of a natural seepage;
- (25) a description and photographs of the equipment used and their specifications; and
- (26) the recommendations for the continuation of the work.

If required and based on the area of the work, the holder may, for the purposes of subparagraph 15 of the first paragraph, submit a number of maps at different scales.

CHAPTER VI**STRATIGRAPHIC SURVEY AUTHORIZATION****DIVISION I****CONDITIONS FOR OBTAINING AN AUTHORIZATION**

69. A licence holder who wishes to obtain a stratigraphic survey authorization must apply to the Minister, in writing, at least 60 days before starting the work.

70. The application must contain

- (1) the name and contact information of the holder and the licence number;
- (2) the name of the proposed stratigraphic survey; and
- (3) the work schedule and an estimate of the realization costs.

71. The application must be accompanied by

- (1) a topographic map at a scale of 1:20,000 showing, in particular,
 - (a) the surface projection of the drill hole profile to the location of the bottom of the hole;
 - (b) the location of the existing drill holes within a radius of 5 km; and
 - (c) the demonstration that the distances provided for in sections 81 and 83 are met;
- (2) the stratigraphic survey technical program provided for in section 72 signed and sealed by an engineer;
- (3) payment of the fee of \$4,426; and
- (4) any other information or document requested by the Minister.

72. The stratigraphic survey technical program must contain

- (1) the name and contact information of the engineer responsible for the program;
- (2) the name, profession and functions of the persons who prepared or revised the program;
- (3) a description and the photographs of the initial condition of the site;
- (4) the demonstration that, during the positioning of the stratigraphic survey, the regional and local geology, and the presence of adjacent drill holes have been taken into consideration;
- (5) the demonstration that the presence of gas in the soil in its natural state has been taken into consideration;
- (6) a chronological and detailed description of the work to be carried out;

- (7) the name and contact information of the enterprise charged with carrying out the work;
- (8) a longitudinal section of the stratigraphic survey indicating the technical elements anticipated before and after the sealing;
- (9) a geological projection including
 - (a) a stratigraphic column indicating the thickness of the unconsolidated deposits, the geological formations, porous and permeable zones, faults and other major structures;
 - (b) the identification of the potential zones of fluid kicks or lost circulation;
 - (c) the anticipated base of the usable groundwater, if it is different from the base provided for in section 3;
 - (d) anticipated primary and secondary petroleum objectives; and
 - (e) if the seismic profile has been done, the interpreted seismic profile indicating the top of geological formations, the shotpoint nearest the location of the drilling and the location of the anticipated petroleum objectives;
- (10) the list of the proposed coring intervals;
- (11) the list of pressure and leak tests, drill-stem tests, formation integrity tests and all other tests planned;
- (12) the list of the well loggings planned;
- (13) a drilling program including, in particular,
 - (a) the type of drilling rig and equipment to be used and their specifications;
 - (b) the drilling fluids and flushing fluids used and their properties, and a demonstration that those fluids comply with the Industry Recommended Practice, IRP: # 25, Primary Cementing, published by the Drilling and Completion Committee;
 - (c) the measures planned for the management of petroleum, formation fluids, drilling fluids, chemical substances and other discharges;
 - (d) the diameters of the drill hole according to the measured depth and the actual vertical depth on a longitudinal section, to the bottom of the planned hole;
 - (e) a graphic projection of the formation pressure and temperature to the expected final depth;
 - (f) a projection of the planned fracturing gradient;
 - (g) a graphic projection of the deviation of the drill path to the expected final depth;
 - (h) the frequency of the measurements of the deviation of the path in dip and azimuth;

(i) the demonstration that the casing strings comply with CSA Standard Z625, Well design for petroleum and natural gas industry systems, published by the Canadian Standards Association; and

(j) a program for centralizing casings that allows to reach a minimum centralization of 75% compliant with the Industry Recommended Practice, IRP: # 25, Primary Cementing, published by the Drilling and Completion Committee, indicating, in particular, the type of centralizers, their dimension, frequency of installation and installation;

(14) a program for cementing annular spaces in each of the casing strings compliant with the Industry Recommended Practice, IRP: # 25, Primary Cementing, published by the *Drilling and Completion Committee* and including, in particular,

(a) the diameters of the casing strings according to the measured depth and the actual vertical depth;

(b) the planned height of the cement column in the annular space;

(c) the cement preparation and application methods;

(d) the planned minimum and maximum pumping flows and the pumping equipment capacity;

(e) the type of cement used, its density, its additives and their proportions, its setting time, calculated volume and surplus percentage;

(f) any changes to the cement required due to specific physical and chemical conditions of the environment, including, in particular, the depth of the stratigraphic survey, an abnormal pressure or temperature, a circulation loss area, salt areas, unconsolidated deposits or a corrosive environment;

(g) the methods used to prepare the drill hole for cementing and to improve fluid displacement, in particular, casing movement; and

(h) the method for monitoring cement circulation in the annular space;

(15) if a simulation or modelling has been carried out, a description of the simulation or modelling and the results obtained;

(16) a site sealing and restoration program including, in particular,

(a) the method used to demonstrate the tightness of the stratigraphic survey carried out before the sealing work;

(b) the stratigraphic survey cleaning method used before installing plugs;

(c) the type of device used and its specifications; and

(d) a cementing program compliant with the Industry Recommended Practice, IRP: # 25, Primary Cementing, published by the Drilling and Completion Committee including, in particular,

i. for each cement plug, the intervals, the type of cement used, its density, its additives and their proportions, its setting time, calculated volume and surplus percentage;

ii. any changes to the cement used for the plugs required due to specific physical and chemical conditions of the environment, including, in particular, the depth of the stratigraphic survey, an abnormal temperature or a corrosive environment;

iii. the method for installing each plug; and

iv. the method and frequency of the monitoring of the position of the plugs during sealing, the waiting time before the monitoring and the criteria of the acceptability of the position of the cement plugs;

(17) the method used to demonstrate that following the installation of the plugs and before the cutting of the casings and surface guide tube, there was no gas emanation;

(18) a description of the activity site restoration work planned for maintaining the quality of the natural landscapes, minimizing impact on wildlife, and harmonizing the activity site with the use of the territory, and a plan presenting the work including, in particular,

(a) the procedure for dismantling installations and, if applicable, the procedure for dismantling the supply cable;

(b) the rehabilitation of contaminated land;

(c) the purge of pipes; and

(d) the withdrawal of equipment and facilities; and

(19) the list of references consulted during the preparation of the technical program, in particular, the standards from recognized organizations and guidelines from other Canadian jurisdictions.

73. The holder may drill a stratigraphic survey in a zone potentially exposed to land movement particularly identified in accordance with government mapping available. If such mapping is not available, the holder cannot drill at less than a horizontal distance measured in relation to the top and base of an embankment that corresponds to twice the height of the embankment.

Despite the foregoing, a licence holder may drill a stratigraphic survey in an area potentially exposed to landslides if the holder provides the Minister, with the application, geotechnical expertise that

(1) assesses the stability of the activity site and confirms that the drill hole will not be threatened by a landslide;

(2) confirms that the expected activity does not act as a triggering factor by destabilizing the activity site and adjacent land; and

(3) confirms that the subsequent activities on the activity site do not constitute an aggravating factor by unduly reducing the safety coefficients

Where applicable, the geotechnical expertise must include recommendations on the precautions to take and the protective measures necessary to maintain at all times the stability of the activity site and the security of the area being examined.

74. Before ruling on the application for authorization, the Minister may, if the Minister deems it necessary to ensure the long-term integrity of the stratigraphic survey, require that the licence holder tests the cement in a laboratory. The test must comply with the Industry Recommended Practice, IRP: # 25, Primary Cementing, published by the Drilling and Completion Committee.

The holder sends the test results to the Minister.

DIVISION II

TIME PERIODS AND NOTICE OF THE START OF THE WORK

75. The authorization holder must, within 12 months after the Minister granted the authorization, start the stratigraphic survey work.

The work is deemed to have started as soon as the first step provided in the work schedule is initiated.

The Minister may grant an additional time period for carrying out the stratigraphic survey if the holder demonstrates the need therefor.

76. The authorization holder must, at least 7 days before, notify the Minister of the start of the following work:

- (1) the preparation of the site where the drilling rig will be located;
- (2) the start of the drilling;
- (3) the sealing of the stratigraphic survey.

Where the holder cannot comply with the date, the holder must as soon as possible notify the Minister, in writing, indicating the reasons justifying the delay. The holder must also notify the Minister, in writing, of the new expected date for the start of the work if the date is expected within 7 days of the first notice of delay or of the holder's intent not to proceed.

77. The authorization holder must, at least 24 hours before, notify the Minister of the rig release and, in the case of a temporary interruption, the holder must also notify the Minister within the same time period of the resumption of the work.

DIVISION III**CONDITIONS OF EXERCISE**

78. The authorization holder must comply with the technical program.

The holder may modify the program by sending to the Minister a supplementary agreement signed and sealed by an engineer stating the nature of the modification and the reasons justifying it. The supplementary agreement must be sent to the Minister before carrying out the work covered by the agreement. If it is urgent to modify the technical program for safety or work quality purposes, the holder must immediately send the agreement to the Minister and justify the urgency.

A supplementary agreement to the technical program is not required in the following cases:

- (1) an adjustment of less than 10 m in the final depth of the stratigraphic survey resulting from a slightly different geological projection;
- (2) a change in the position of the stratigraphic survey where it remains on the activity site;
- (3) the addition or cancellation of a coring section, a drill-stem test, a well logging, a sample collection or a fluid sample.

In the situations provided for in the third paragraph, the holder immediately notifies the Minister of the change to the technical program.

79. The authorization holder must design and build the stratigraphic survey so as to

- (1) comply with the Industry Recommended Practice, IRP: # 25, Primary Cementing, published by the Drilling and Completion Committee;
- (2) ensure work safety;
- (3) prevent incidents in the maximum load conditions normally foreseeable during the life cycle of the stratigraphic survey;
- (4) withstand potential conditions, forces and stresses;
- (5) ensure a resistance sufficient for fluid kicks;
- (6) protect the integrity of the groundwater;
- (7) allow the characterization of the geological formations targeted; and
- (8) allow activities for controlling the pressure of the bottom of the drill hole in a constant and safe manner.

80. The authorization holder must, as soon as the work starts and until the site restoration work starts, install a sign at the entrance of the activity site indicating, in particular,

- (1) the location of the stratigraphic survey;
- (2) the holder's name and the licence number;
- (3) the name and number of the stratigraphic survey appearing on the authorization;
- (4) a telephone number in case of emergency; and
- (5) the pictograms associated with the hazardous products present on the activity site.

81. The authorization holder may not position the collar of a stratigraphic survey

- (1) less than 40 m from a public highway within the meaning of the Highway Safety Code or a railway;
- (2) less than 100 m from a transmission line having a voltage equal to or greater than 69,000 V, a telecommunication infrastructure, a windmill, pipeline or any other installation or infrastructure of the same type;
- (3) less than 100 m from a cemetery or surface improvement work for sporting or recreational purposes;
- (4) less than 150 m from any building having fewer than 3 floors or a floor area less than or equal to 10,000 m²;
- (5) less than 175 m from a concentration of residential, commercial, industrial or service activities;
- (6) less than 180 m from a high-capacity dam within the meaning of the Dam Safety Act;
- (7) less than 275 m from a health and social services institution, a teaching institution, a building in which childcare services are offered, a classified heritage site entered in the cultural heritage register referred to in section 5 of the Cultural Heritage Act (chapter P-9.002), any building having 3 floors or more or a floor area greater than 10,000 m²; or
- (8) less than 1 000 m from an airport or an aerodrome.

The distances must be measured horizontally, in a straight line, from the collar to the nearest point of the elements referred to in the first paragraph.

The Minister may allow the reduction of the distances if the authorization holder demonstrates to the Minister that an effective protective measure reduces risks.

The distances provided for in the first paragraph do not apply with respect to buildings belonging to the authorization holder or used for the work.

82. The authorization holder may not drill a stratigraphic survey less than 100 m from the boundaries of the territory covered by the holder's licence.

- 83.** The authorization holder may not position the activity site less than 60 m from a national park or a protected area entered in the protected area register provided for in section 5 of the Natural Heritage Conservation Act (chapter C-61.01).
- 84.** During the drilling, the authorization holder must make sure that
- (1) the stratigraphic survey is drilled so as to never intersect an existing drill hole;
 - (2) the drilling fluids, drilling fluid system and associated monitoring equipment are designed, installed, used or maintained to provide an effective barrier against formation pressure and to allow for an adequate characterization of the geological formations investigated;
 - (3) the indicators and alarms associated with the monitoring equipment are installed on the drilling rig to alert onsite personnel; and
 - (4) adequate procedures, facilities and equipment are in place and utilized to minimize the risk of loss of stratigraphic survey control in the event of lost circulation, fluid kicks or blowout.
- 85.** The authorization holder must ensure that the measurements of the stratigraphic survey path deviation are taken at intervals that allow the position of the drill hole to be determined accurately and that do not exceed 150 m, unless there is a soil stability problem.
- 86.** The authorization holder must protect the usable groundwater and use non-toxic substances in drilling fluids until the surface casing is cemented.
- 87.** Where the authorization holder drills a stratigraphic survey in a region where the geology is unknown or in a region where shallow gas kicks have been documented, the holder must use a deflector.
- 88.** If it is foreseeable that a petroleum zone will be intersected before reaching the depth for the installation of the surface casing, the authorization holder must install a blowout prevention system.
- 89.** While performing the work under the surface casing, the authorization holder must use a wellhead or a blowout prevention system comprising at least 2 different sealing mechanisms for as long as there is a risk of fluid kicks.
- 90.** The wellhead or the blowout prevention system must have been designed to withstand a rated pressure equal to or greater than the maximum formation pressure provided for in the technical program. Where it has not been provided for, it is deemed to be equal to or greater than 11 kPa/m of the actual vertical depth of the stratigraphic survey.
- 91.** The authorization holder must verify daily the blowout prevention system to make sure it works well. If a system component is defective, work must be suspended until the component is repaired.

92. The authorization holder must regularly inspect joints and structural elements of every equipment used to control the pressure to ensure the safe operation of the equipment.

The holder keeps and maintains, until the end of the sealing work, a register of those inspections.

93. The authorization holder must eliminate or reduce to a minimum the volume of gas released into the atmosphere. The holder must install an ignition pilot at the flare for burning combustible gas.

94. During the operations for preparing and applying the cement for cementing casings and for sealing plugs, the authorization holder must comply with the Industry Recommended Practice, IRP: # 25, Primary Cementing, published by the Drilling and Completion Committee.

95. Before proceeding with the cementing of annular spaces, the authorization holder must make sure to completely remove the drilling fluids and the mud cakes from the walls of the stratigraphic survey.

96. During the cementing, the authorization holder must ensure that the fluid returns are observed at the surface.

97. The cement used for cementing casings and for sealing plugs must reach the minimum compressive strength of 3,500 kPa after 36 hours of hardening at the temperature of the shallowest formation to be covered.

The authorization holder must restrict the cement shrinkage process and limit to the minimum the risk of formation of a micro-annular space.

98. As of the moment at which the cement has developed a gel strength and until the minimum compressive strength has been reached, the authorization holder must not carry out work that could compromise the integrity of the cement and the holder must comply with the Industry Recommended Practice, IRP: # 25, Primary Cementing, published by the Drilling and Completion Committee.

99. The authorization holder must carry out a cement assessment sonic or ultrasonic logging to show the uniform coverage of the cement behind each casing.

100. After installing and cementing a casing and before drilling out the casing shoe, the authorization holder must submit the casing to a pressure and leak test to the value required to confirm its integrity for the maximum operating pressure provided for in the technical program.

The integrity is confirmed if the stabilized pressure is at least 90% of the pressure applied over a minimum interval of 10 minutes.

101. Before drilling at a measured depth of more than 10 m under the shoe of any casing subsequent to the conductor casing, the authorization holder must test the integrity of the geological formation.

The test must be conducted at a pressure that ensures the safety of the drilling work until the next casing string planned.

The integrity is confirmed if the stabilized pressure is at least 90% of the pressure applied over a minimum interval of 10 minutes.

102. The authorization holder who conducts a drill-stem test must ensure, in particular, that

- (1) the equipment used is designed to safely control the stratigraphic survey pressure, properly characterize the geological formation and protect the environment;
- (2) the rated pressure of the equipment upstream of and including the testing manifold exceeds the maximum anticipated shut-in pressure; and
- (3) the equipment downstream of the testing manifold is sufficiently protected against overpressure.

103. In the case of fluid kicks or during drill-stem tests, the authorization holder must collect samples and analyze the petroleum and groundwater encountered.

In the case of gas, the analyses must, in particular, identify its composition and characterize the carbon isotope ratios. For a vertical or directional drilling, the holder must take a minimum of 15 samples per interval of 1,000 m drilled under the surface casing.

In the case of oil, the analyses must, in particular, identify its composition and characterize its viscosity and density.

In the case of groundwater, the analyses must, in particular, identify its composition in dissolved solids and petroleum and its physical characteristics, including the pH, the conductivity and the cloudiness.

The Minister may exempt the authorization holder from the requirement to collect certain samples where the Minister considers that he or she already has sufficient data to characterize the reservoir or the sealing rocks.

If the holder collects another sample of gas, including gas dissolved in the drilling fluids or gas from the surface casing blowhole, the holder must analyze it to identify its composition and characterize the carbon isotopic ratios.

A holder who collects a sample must use a method preventing contamination of the sample.

104. The authorization holder must collect a sample of the drilling core, at least at each interval of 100 m, to determine, in particular, the porosity, permeability, lithology and content in total organic carbon of the geological formation.

For the stratigraphic survey sections that are not cored, a cutting sample must be collected at each 5-m interval in such manner as to fill

- (1) a 10-ml flask of cuttings washed and dried beforehand; samples from the layer of unconsolidated deposits must not be washed; and
- (2) a 500-g bag of cuttings dried beforehand.

105. Where samples necessary for analysis have been taken from a core, the authorization holder makes sure that a longitudinal slab that is not less than one half of the cross-sectional area of that core or the remaining core is submitted to the Minister.

The holder who carried out destructive tests on a core removed laterally is exempt from submitting the samples.

106. The samples collected must be stored in durable containers designed for that purpose and properly labelled by indicating, in particular, the name of the stratigraphic survey and the measured interval or depth of the sampling.

They must be transported and stored in a manner that prevents any loss or deterioration.

107. The authorization holder submits to the Minister the samples whose analysis is completed not later than 90 days after the rig release date.

The Minister may agree to an additional period if the holder wishes to perform additional analyses. In that case, the holder submits to the Minister the samples and analysis results at the end of the agreed period.

The Minister may exempt the holder from the submission of the samples

(1) where the Minister considers that he or she has sufficient samples to adequately document the geological formations intersected by the stratigraphic survey; and

(2) where the Minister already has samples from the same horizons.

108. Before disposing of any cutting samples, drilling cores or collected fluids, the authorization holder must offer them to the Minister.

109. The authorization holder must submit to the Minister, for approval, the corrective actions to be taken where any of the following situations occurs:

(1) a cementing operation provided for in the technical program cannot be carried out;

(2) no cement return has been observed on the surface where such return was expected;

(3) a drilling fluid return indicates that the cement height required for cementing has not been reached;

(4) there is uncertainty as to reaching the cementing goals.

DIVISION IV

STRATIGRAPHIC SURVEY SEALING AND SITE RESTORATION

110. The authorization holder must seal the stratigraphic survey within 30 days after completion of the drilling.

The Minister may require that the work start before that period for safety reasons or give an additional period for its completion if the holder shows that it is necessary.

111. Before beginning the stratigraphic survey sealing, the authorization holder must conduct a pressure and leak test to ensure the tightness of all the stratigraphic survey components.

The holder may begin the sealing only if the pressure and leak test is successful. Tightness is confirmed if the stabilized pressure is at least 90% of the pressure applied over a minimum interval of 10 minutes. Otherwise, an incident notice must be sent to the Minister within 24 hours.

112. The authorization holder who proceeds with the sealing must ensure to seal the stratigraphic survey over its entire length.

The holder must also ensure the following:

- (1) the absence of communication of fluids between the geological formations;
- (2) the absence of liquid flow and gas emanation or migration;
- (3) the absence of excessive pressure in the stratigraphic survey;
- (4) the long-term integrity of the stratigraphic survey, while considering the petroleum development potential of the adjacent sector and the impact of future activities.

113. The authorization holder must not install a cement plug in a section of the hole that does not have a casing, except if the drilling is vertical.

114. The authorization holder must cut the casings and the guide tube at 1 m below the surface.

Where it is justified by agricultural activities, the holder may, with the Minister's authorization, cut the casings and the guide tube at 1.6 m below the surface.

115. The authorization holder must weld a ventilated steel cover at the top of the casings.

116. The authorization holder must restore the activity site as soon as the sealing work ends or the meteorological conditions allow.

The Minister may grant an additional time period for the restoration if the holder shows it is necessary. In that case, the holder must, at least 7 days before, notify the Minister, in writing, of the start of the work for restoring the site.

117. As soon as the sealing work ends, the authorization holder must mark the stratigraphic survey with a steel plate at least 150 mm wide and 300 mm high indicating, in relief, the number of the stratigraphic survey and its geographical coordinates.

The plate must be fixed 1.5 m above the surface of the ground using a metal rod welded to the outside casing of the stratigraphic survey.

Where it is justified by agricultural activities, the holder may, with the Minister's authorization, position the plate as close as possible to the stratigraphic survey and indicate the azimuth and the distance at which the stratigraphic survey is located.

DIVISION V

DAILY REPORT AND COMPLETION REPORT

118. The holder of a stratigraphic survey authorization must draw up a daily report of the work and keep it on the activity site.

The daily report must contain all the elements applicable to the declared day including, in particular,

- (1) the number of the stratigraphic survey authorization;
- (2) a description, in chronological order, of the work carried out and the time required for completing each step of the work;
- (3) the name and contact information of the enterprises that carried out the work;
- (4) the measured depth reached during the day;
- (5) the composition of the drilling fluid and flushing fluid, and the volumes used;
- (6) the operating condition of the blowout prevention system;
- (7) a loss of circulation;
- (8) the components used to assemble the strings;
- (9) the specifications of the casing and its setting depth;
- (10) the weight applied to the bit and its penetration rate;
- (11) the measurements of the deviation of the stratigraphic survey path in dip, azimuth and depth;
- (12) traces of petroleum or water detected;
- (13) the type of pump used for the cementing and its capacity;
- (14) the type of cement used, its density, its additives and their proportions, its setting time and the volume used;
- (15) the well loggings carried out;
- (16) the observations and data related to the evaluation or characterization of the geological formation;
- (17) the fluid samples collected;
- (18) the results of the pressure and leak tests;

- (19) the volume and composition of the gas used, released, incinerated or burnt at the flare;
- (20) the composition, concentration and detailed assessment of all the products stored and used on the activity site, in particular, drilling fluids;
- (21) the operational problems encountered and the corrective measures taken or planned;
- (22) the indication of any temporary work interruption and the procedure followed to secure the stratigraphic survey;
- (23) the indication of any event that disrupted the planned progress of the work; and
- (24) any other information or document deemed necessary by the Minister.

119. The authorization holder must send to the Minister, every Monday, the daily reports of the preceding week until the end of the sealing work. If the Monday is a holiday, the report is sent on the first working day that follows.

120. The authorization holder must send to the Minister, within the period provided for in section 100 of the Act, a completion report signed by an engineer including, in particular,

- (1) the number of the stratigraphic survey authorization;
- (2) the name and contact information of the licence holder;
- (3) the coordinates of the stratigraphic survey collar on a plan provided by a land surveyor according to the NAD83 map reference system;
- (4) the measurements of the deviation of the stratigraphic survey path in dip, azimuth and depth, and the final coordinates of the bottom of the hole;
- (5) a summary of the work carried out in chronological order;
- (6) a report on the cementing operations for each of the casing strings, containing, in particular,
 - (a) the name and contact information of the enterprise that carried out the cementing work;
 - (b) the type of cementing unit used and the method for applying the cement; if no return is observed, a description of the corrective actions taken;
 - (c) the type of cement used, its density, its additives and their proportions, the setting time and the volume used;
 - (d) the cemented interval;
 - (e) the composition and volume of the flushing fluid and the spacing fluid used;
 - (f) the circulation pressures;

- (g) the propping pressure applied and the duration; and
- (h) a description of the cement return, the quantity and the retreat;
- (7) the analysis results and the analysis certificates of the samples and fluid samples collected;
- (8) the interpreted well loggings, re-set in actual vertical depth, and the corrections made;
- (9) the demonstration that the centralization of the casings complies with the Industry Recommended Practice, IRP: # 25, Primary Cementing, published by the Drilling and Completion Committee;
- (10) the measured temperature and pressure to the final depth of the stratigraphic survey;
- (11) the data, recordings, results of the drill-stem tests, pressure and leak tests, formation integrity tests and their interpretation;
- (12) a geological description of the cuttings and drill cores, and a geotechnical description of the drill cores;
- (13) a comparative analysis of the work carried out compared with that provided for in the technical program and the results obtained compared with those anticipated;
- (14) the list of drill bits used, their type and the number of metres drilled by each;
- (15) the type of play encountered and a comparison with a similar oil zone;
- (16) a longitudinal section of the stratigraphic survey after the sealing, according to the measured depth and the actual vertical depth, signed and sealed by an engineer, indicating, in particular,
 - (a) intersected groups, geological formations, lithological contacts and faults;
 - (b) zones of abnormal pressure;
 - (c) the diameter of the drill hole and the diameters of each of the casings and the guide tube;
 - (d) the location of each of the casings and the guide tube;
 - (e) if applicable, the depth interval of the open stratigraphic survey;
 - (f) the type of plugs used and the depth intervals of each plug; and
 - (g) the other equipment installed or dropped in the stratigraphic survey and not recovered;
- (17) the daily tour reports;
- (18) if laboratory testing has been done on the cement after the granting of the authorization, the properties of the cement determined in the laboratory;
- (19) the technical reports prepared by the enterprises that carried out the work;

- (20) a technical description of the condition of the stratigraphic survey before the sealing;
- (21) in the case of the cement plugs used,
 - (a) the name and contact information of the enterprise that carried out the cementing work;
 - (b) the type of cementing unit used and the method for applying the cement;
 - (c) the type of cement used, its density, its additives and their proportions, its setting time and the volume used;
 - (d) the verified position of each of the plugs; and
 - (e) if applicable, the analysis results and the analysis certificates of the samples collected;
- (22) the cutting depth of the casings and the guide tube under the surface;
- (23) a photograph of the ventilated steel plated welded at the top of the casings before the backfilling;
- (24) a plan showing the layout of the activity site after the restoration work; and
- (25) photographs of the entire restored activity site.

CHAPTER VII

DRILLING AUTHORIZATION

DIVISION I

CONDITIONS FOR OBTAINING AN AUTHORIZATION

121. A licence holder who wishes to obtain a drilling authorization must apply to the Minister, in writing, at least 60 days before starting the work.

122. The application must contain

- (1) the name and contact information of the holder and the licence number;
- (2) the name of the proposed well, in the case of a new well, or the name of the existing well, in the case of a re-entry; and
- (3) the work schedule and an estimate of the realization costs.

123. The application must be accompanied by

- (1) a topographic map at a scale of 1:20,000 showing, in particular,
 - (a) the surface projection of the hole profile to the location of the bottom of the hole;
 - (b) the location of the existing drill holes within a radius of 5 km; and
 - (c) the demonstration that the distances provided for in sections 133 to 135 are met;

- (2) the drilling technical program provided for in section 124 signed and sealed by an engineer;
- (3) the permanent well or reservoir closure and site restoration plan or, if applicable, its update, and the guarantee provided for in sections 322 and 324;
- (4) payment of the fee of \$4,426; and
- (5) any other information or document requested by the Minister.

124. The drilling technical program must contain

- (1) the name and contact information of the engineer responsible for the program;
- (2) the name, profession and functions of the persons who prepared or revised the program;
- (3) the demonstration that, during the positioning of the well, the regional and local geology, and the presence of adjacent drill holes have been taken into consideration;
- (4) the demonstration that the presence of gas in the soil in its natural state has been taken into consideration;
- (5) if applicable, the list of the data that could be consulted with respect to the adjacent drill holes;
- (6) the proposed classification of the well, determined according to Schedule 1;
- (7) a chronological and detailed description of the work to be carried out;
- (8) the name and contact information of the enterprise charged with carrying out the work;
- (9) a longitudinal section of the well indicating the technical elements;
- (10) a geological projection including, in particular,
 - (a) a stratigraphic column indicating the thickness of the unconsolidated deposits, the geological formations, porous and permeable zones, faults and other major structures;
 - (b) the identification of the potential zones of fluid kicks or lost circulation;
 - (c) the anticipated base of the usable groundwater, if it is different from the base provided for in section 3;
 - (d) the anticipated primary and secondary petroleum objectives; and
 - (e) if the seismic profile has been done, the interpreted seismic profile indicating the top of geological formations, the shotpoint nearest the location of the drilling and the location of the anticipated petroleum objectives;
- (11) the list of the planned coring intervals;

- (12) the list of pressure and leak tests, drill-stem tests, formation integrity tests and all other tests planned;
- (13) the list of the well loggings planned;
- (14) a drilling program including, in particular,
- (a) the type of drilling rig and equipment to be used and their specifications;
 - (b) the drilling fluids and flushing fluids used and their properties, and a demonstration that those fluids comply with the Industry Recommended Practice, IRP: # 25, Primary Cementing, published by the Drilling and Completion Committee;
 - (c) the measures planned for the management of petroleum, formation fluids, drilling fluids, chemical substances and other discharges;
 - (d) the diameters of the drill hole according to the measured depth and the actual vertical depth on a longitudinal section, to the bottom of the planned hole;
 - (e) a graphic projection of the formation pressure and temperature to the expected final depth;
 - (f) a projection of the planned fracturing gradient;
 - (g) a graphic projection of the deviation of the drill path to the expected final depth;
 - (h) the frequency of the measurements of the deviation of the path in dip and azimuth;
 - (i) the demonstration that the planned casing strings and tubes comply with CSA Standard Z625, Well design for petroleum and natural gas industry systems, except those installed in a storage well, which must comply with CSA Standard Z341, Storage of hydrocarbons in underground formations, published by the Canadian Standards Association;
 - (j) a program for centralizing casings that allows to reach a minimum centralization of 75% compliant with the Industry Recommended Practice, IRP: # 25, Primary Cementing, published by the Drilling and Completion Committee, indicating, in particular, the type of centralizers, their dimension, frequency of installation and installation; and
 - (k) in the case of a re-entry, the evaluation of the thickness of the casing string and the calculation of the stresses to which the well may be submitted in accordance with CSA Standard Z625, Well design for petroleum and natural gas industry systems, published by the Canadian Standards Association; for a storage well, the evaluation and calculation must comply with CSA Standard Z341, Storage of hydrocarbons in underground formations, published by the Canadian Standards Association;

(15) a program for the cementing of the annular spaces of each of the casing strings compliant with the Industry Recommended Practice, IRP: # 25, Primary Cementing, published by the Drilling and Completion Committee and including, in particular,

(a) the diameters of the casing strings compared with the measured depth and the actual vertical depth;

(b) the planned height of the cement column in the annular space;

(c) the cement preparation and application methods;

(d) the planned minimum and maximum pumping flows and the pumping equipment capacity;

(e) the type of cement used, its density, its additives and their proportions, its setting time, the calculated volume and surplus percentage;

(f) any changes to the cement required due to specific physical and chemical conditions of the environment, including, in particular, the depth of the well, an abnormal pressure or temperature, a circulation loss area, salt areas, unconsolidated deposits or a corrosive environment;

(g) the methods used to prepare the well for cementing and to improve movement of the fluids, in particular, casing movement; and

(h) the method for monitoring cement circulation in the annular space;

(16) if a simulation or modelling has been carried out, a description of the simulation or modelling and the results obtained; and

(17) the list of references consulted during the preparation of the technical program, in particular, the standards from recognized organizations and guidelines from other Canadian jurisdictions.

Where work is planned in a temporarily closed well, the holder must, before it is carried out, inspect the site and the wellhead, maintain the wellhead and carry out a pressure and leak test. In that case, the technical program must also contain the annual inspection worksheet provided for in Schedule 2.

125. The holder may drill a well in a zone potentially exposed to land movement particularly identified in accordance with government mapping available. If such mapping is not available, the holder cannot drill at less than a horizontal distance measured in relation to the top and base of an embankment that corresponds to twice the height of the embankment

Despite the foregoing, a licence holder may drill a well in an area potentially exposed to landslides if the holder provides the Minister, with the application, the geotechnical expertise provided for in section 73, with the necessary modifications.

126. Before ruling on a drilling application, Minister may, if the Minister considers it necessary to ensure the long-term integrity of the well, require that the licence holder carry out a cement test in a laboratory. The test must comply with the Industry Recommended Practice, IRP: # 25, Primary Cementing, published by the Drilling and Completion Committee.

The holder sends the results of the test to the Minister.

DIVISION II

TIME PERIODS AND NOTICE OF THE START OF THE WORK

127. The authorization holder must, within 12 months after the granting of the authorization, start the drilling work.

128. The authorization holder must, at least 7 days before, notify the Minister of the date for the start of the following work:

- (1) the preparation of the site in which the drilling rig will be located;
- (2) the beginning of the drilling or the re-entry.

Where the holder cannot comply with the date, the holder must as soon as possible notify the Minister, in writing, indicating the reasons justifying the delay. The holder must also notify the Minister, in writing, of the new expected date for the start of the work if the date is expected within 7 days of the first notice of delay or of the holder's intent not to proceed.

129. The authorization holder must, at least 24 hours before, notify the Minister of the rig release and, in case of a temporary interruption, the holder must also notify the Minister within the same period of the resumption of the work.

SECTION III

CONDITIONS OF EXERCISE

130. The authorization holder must comply with the technical program.

The holder may modify the program by sending to the Minister a supplementary agreement signed and sealed by an engineer stating the nature of the modification and the reasons justifying it. The supplementary agreement must be sent to the Minister before carrying out the work covered by the agreement. If it is urgent to modify the technical program for safety or work quality purposes, the holder must immediately send the agreement to the Minister and justify the urgency.

A supplementary agreement to the technical program is not required in the following cases:

- (1) an adjustment of less than 10 m in the final depth of the well resulting from a slightly different geological projection;
- (2) a change in the position of the well where the well remains on the activity site;

- (3) the addition or cancellation of a coring section, a drill-stem test, a sample collection or a fluid sample;
- (4) the addition or cancellation of a well logging if, in the latter case, it is not required under section 138 or 139.

In the situations provided for in the third paragraph, the holder immediately notifies the Minister of the change to the technical program.

131. The authorization holder must design and construct the well so as to

- (1) comply with the Industry Recommended Practice, IRP: # 25, Primary Cementing, published by the Drilling and Completion Committee;
- (2) ensure work safety;
- (3) prevent incidents in the maximum load conditions normally foreseeable during the life cycle of well;
- (4) withstand potential conditions, forces and stresses;
- (5) ensure a resistance sufficient for fluid kicks;
- (6) protect the integrity of the groundwater;
- (7) ensure that the petroleum zones and the aquifer layers are isolated from one another;
- (8) allow the characterization of the geological formations targeted; and
- (9) allow activities for controlling the pressure of the bottom of the drill hole in a constant and safe manner.

132. The authorization holder must, as soon as the work starts and until the holder begins the work for the permanent closure of the well and the restoration of the site, install a sign at the entrance to the site, indicating, in particular,

- (1) the location of the well;
- (2) the holder's name and the licence number;
- (3) the name and number of the well appearing on the authorization;
- (4) a telephone number in case of emergency; and
- (5) the pictograms associated with the hazardous products present on the site.

133. The authorization holder may not position the collar of a well or, in the case of a re-entry, drill in a well whose collar is situated

- (1) less than 40 m from a public highway within the meaning of the Highway Safety Code or a railway;

- (2) less than 100 m from a transmission line having a voltage equal to or greater than 69,000 V, a telecommunication infrastructure, a windmill, a pipeline or any other installation or infrastructure of the same type;
- (3) less than 100 m from a cemetery or surface improvement work for sporting or recreational purposes;
- (4) less than 150 m from any building having fewer than 3 floors or a floor area less than or equal to 10,000 m²;
- (5) less than 175 m from a concentration of residential, commercial, industrial or service activities;
- (6) less than 180 m from a high-capacity dam within the meaning of the Dam Safety Act;
- (7) less than 275 m from a health and social services institution, a teaching institution, a building in which childcare services are offered, a classified heritage site entered in the cultural heritage register referred to in section 5 of the Cultural Heritage Act, any building having 3 floors or more or a floor area greater than 10,000 m²; or
- (8) less than 1 000 m from an airport or an aerodrome.

The distances must be measured horizontally, in a straight line, from the collar to the nearest point of the elements referred to in the first paragraph.

The Minister may allow the reduction of the distances if the authorization holder demonstrates to the Minister that an effective protective measure reduces risks.

The distances provided for in the first paragraph do not apply with respect to buildings belonging to the authorization holder or used for the work.

134. The authorization holder may not drill a well less than 100 m from the boundaries of the territory covered by the holder's licence.

135. The authorization holder may not position the activity site less than 60 m from a national park or a protected area entered in the register of protected areas provided for in section 5 of the Natural Heritage Conservation Act.

136. During the drilling of a well, the authorization holder must make sure that

- (1) the well is drilled so as to never intersect an existing drill hole, except if the well covered by the authorization is a relief well;
- (2) the drilling fluids, drilling fluid system and associated monitoring equipment are designed, installed, used or maintained to provide an effective barrier against formation pressure and to allow for an adequate characterization of the geological formations investigated;

(3) the indicators and alarms associated with the monitoring equipment are installed on the drilling rig to alert onsite personnel; and

(4) adequate procedures, facilities and equipment are in place and utilized to minimize the risk of loss of well control in the event of lost circulation, fluid kicks or blowout.

137. The authorization holder must ensure that the measurements of the well path deviation are taken at intervals that allow the position of the drill hole to be determined accurately and that do not exceed 150 m, unless there is a soil stability problem.

138. The authorization holder must carry out the well loggings necessary to be able to define the lithology, porosity, type of the fluids present in each of the geological formations intersected by the surface casing to the well collar and in depth, under the surface casing.

The holder must, in particular, carry out

(1) a gamma ray logging from the well collar to the final depth of the drill hole;

(2) a neutron logging from 25 m under the well collar to the base of the surface casing; and

(3) an electrical resistivity logging and a porosity logging from the base of the surface casing to the final depth of the drill hole.

The Minister may exempt the holder from the requirement to carry out certain well loggings in the case of a production well or if the Minister considers that he or she already has sufficient data to characterize the reservoir or the sealing rocks.

139. The authorization holder must also carry out a cement assessment sonic or ultrasonic logging to show the uniform coverage of the cement behind each casing. In the case of a horizontal well, the logging must be carried out at least until an 80° angle has been reached in relation to the vertical.

140. The authorization holder must protect the usable groundwater and use non-toxic substances in the drilling fluids until the surface casing is cemented.

141. Where the authorization holder drills a well in a region where the geology is unknown or in a region where shallow gas kicks have been documented, the holder must use a deflector.

142. If it is foreseeable that a petroleum zone will be intersected before reaching the depth for the installation of the surface casing, the authorization holder must install a blowout prevention system.

143. While performing the work under the surface casing, the authorization holder must use a wellhead or a blowout prevention system comprising at least 2 different sealing mechanisms for as long as there is a risk of fluid kicks.

144. The wellhead or the blowout prevention system must have been designed to withstand a rated pressure equal to or greater than the maximum formation pressure provided for in the technical program. Where it has not been provided for, it is deemed to be equal to or greater than 11 kPa/m of the actual vertical depth of the well.

145. The authorization holder must verify daily the blowout prevention system to make sure it works well. If a system component is defective, work must be suspended until the component is repaired.

146. The authorization holder must regularly inspect joints and structural elements of every equipment used to control the pressure to ensure the safe operation of the equipment.

The holder keeps and maintains, until the end of the work for the permanent closure of the well, a register of those inspections.

147. The authorization holder must eliminate or reduce to a minimum the volume of gas released into the atmosphere. The holder must install an ignition pilot at the flare for burning combustible gas.

148. If a surface casing is installed, the authorization holder must ensure that it is inserted in a competent formation at a depth allowing for a sufficient anchoring of the well blowout preventer, ensures the control of anticipated pressures in the well and is equipped with an opening valve.

149. The authorization holder must install a conductor casing if

- (1) the surface casing is laid at an actual vertical depth exceeding 650 m;
- (2) it is foreseeable that a petroleum zone will be intersected before reaching the laying depth of the surface casing;
- (3) an adjacent drill hole or a shot hole encountered groundwater flow on the surface; and
- (4) the well is located less than 100 m from a body of water.

The conductor casing must be fixed in a competent formation.

If a shallow aquifer presents artesian pressure conditions, the conductor casing must be fixed directly above the aquifer.

150. In the case of the cementing of the surface casing, the authorization holder may not add to the cement charges or additives reducing its compressive strength.

151. In the case of the cementing of a casing, the authorization holder must determine the volume of cement required according to the Industry Recommended Practice, IRP: # 25, Primary Cementing, published by the Drilling and Completion Committee.

152. Surface casings and, if applicable, intermediate casings subject to wear caused by the movement and rotation of the drill-stems must be inspected, at a maximum interval of 30 days, to determine their integrity, in accordance with the casing integrity inspection procedure provided for in Schedule 3.

153. Before proceeding with the cementing of annular spaces, the authorization holder must make sure to completely remove the drilling fluids and the mud cakes from the walls of the well.

154. During cementing, the authorization holder must ensure that surface fluid returns are observed.

155. The cement used must reach a minimum compressive strength of 3,500 kPa after 36 hours of hardening at the temperature of the shallowest formation to be covered.

The authorization holder must restrict the cement shrinkage process and limit to the minimum the risk of formation of a micro-annular space.

156. As of the moment at which the cement has developed a gel strength and until the minimum compressive strength has been reached, the authorization holder must not carry out work that could compromise the integrity of the cement and the holder must comply with the Industry Recommended Practice, IRP: # 25, Primary Cementing, published by the Drilling and Completion Committee.

157. After installing and cementing the casing and before drilling out the casing shoe, the authorization holder must submit the casing to a pressure and leak test to the value required to confirm its integrity for maximum operating pressure provided for in the technical program.

The integrity is confirmed if the stabilized pressure is at least 90% of the pressure applied over a minimum interval of 10 minutes.

158. Before drilling at a measured depth of more than 10 m under the shoe of any casing subsequent to the conductor casing, the authorization holder must test the integrity of the geological formation.

The test must be conducted at a pressure that allows the safety of the drilling work to the next casing string planned.

The integrity is confirmed if the stabilized pressure is at least 90% of the pressure applied over a minimum interval of 10 minutes.

159. The authorization holder who conducts a drill-stem test must ensure, in particular, that

(1) the equipment used is designed to safely control the well pressure, properly characterize the geological formation and protect the environment;

(2) the rated pressure of the equipment upstream of and including the testing manifold exceeds the maximum anticipated shut-in pressure; and

(3) the equipment downstream of the testing manifold is sufficiently protected against overpressure.

160. In the case of fluid kicks or during drill-stem tests, the authorization holder must collect samples and analyze the petroleum and groundwater encountered.

In the case of gas, the analyses must, in particular, identify its composition and characterize the carbon isotope ratios. For a vertical or directional drilling, the holder must take a minimum of 15 samples per interval of 1,000 m drilled under the surface casing. In the case of a horizontal drilling, the holder must take a minimum of 15 samples per interval of 1,000 m drilled between the surface casing and the reaching of an 80° angle in relation to the vertical.

In the case of oil, the analyses must, in particular, identify its composition and characterize its viscosity and density.

In the case of groundwater, the analyses must, in particular, identify its composition in dissolved solids and petroleum and its physical characteristics, including the pH, the conductivity and the cloudiness.

The Minister may exempt the authorization holder from the requirement to collect certain samples where the Minister considers that he or she already has sufficient data to characterize the reservoir or the sealing rocks.

If the holder collects another sample of gas, including gas dissolved in the drilling fluids or gas from the surface casing blowhole, the holder must analyze it to identify its composition and characterize the carbon isotopic ratios.

A holder who collects a sample must use a method preventing contamination of the sample.

161. The authorization holder must collect a sample of the drilling core, at least at each interval of 100 m, to determine, in particular, the porosity, permeability, lithology and content in total organic carbon of the geological formation.

For the well sections that are not cored, a cutting sample must be collected at the following intervals:

(1) every 25 m, from the top of the rock to an actual vertical depth of 50 m above the shallowest anticipated petroleum objective, unless the holder demonstrates that an adjacent drill hole has already been sampled and the spatial variability makes sampling unnecessary;

(2) in the case of vertical and directional wells, every 5 m from an actual vertical depth of 50 m above the shallowest anticipated petroleum objective to the final depth;

(3) in the case of horizontal wells, every 5 m from an actual vertical depth of 50 m above the shallowest anticipated petroleum objective to the reaching of an 80° angle in relation to the vertical, then the interval is 10 m to the final depth.

Cutting samples must be collected in such a manner as to fill

(1) a 10-ml flask of cuttings washed and dried beforehand; samples from the layer of unconsolidated deposits must not be washed; and

(2) a 500-g bag of cuttings dried beforehand.

162. Where samples necessary for analysis have been taken from a core, the authorization holder makes sure that a longitudinal slab that is not less than one half of the cross-sectional area of that core or the remaining core is submitted to the Minister.

The holder who carried out destructive tests on a core removed laterally is exempt from submitting the samples.

163. The samples collected must be stored in durable containers designed for that purpose and properly labelled by indicating, in particular, the name of the well and the measured interval or depth of the sampling.

They must be transported and stored in a manner that prevents any loss or deterioration.

164. The authorization holder submits to the Minister the samples whose analysis is completed not later than 90 days after the rig release date.

The Minister may agree to an additional period if the holder wishes to perform additional analyses. In that case, the holder submits to the Minister the samples and analysis results at the end of the agreed period.

The Minister may exempt the holder from the submission of the samples

(1) where the Minister considers that he or she has sufficient samples to adequately document the geological formations intersected by the well; and

(2) where the Minister already has samples from the same horizons.

165. Before disposing of any cutting samples, drilling cores or collected fluids, the authorization holder must offer them to the Minister.

166. The authorization holder must submit to the Minister, for approval, the corrective actions to be taken where any of the following situations occurs:

(1) a cementing operation provided for in the technical program cannot be carried out;

(2) no cement return is observed on the surface where such return was planned;

(3) a return of displaced drilling fluid indicates that the cement height required for cementing is not reached;

(4) there is uncertainty as to reaching the cementing goals.

167. An authorization holder must, in the case of an observation well, use a wellhead.

168. An authorization holder must, in the case of an observation well, send to the Minister, not later than 31 December of each year, a report signed and sealed by an engineer containing the data collected and the frequency of the collection and the annual inspection worksheet provided for in Schedule 2.

DIVISION IV**DAILY REPORT AND COMPLETION REPORT**

169. The authorization holder must draw up a daily report of the work and keep it on the activity site.

The daily report must contain all the elements applicable to the declared day including, in particular,

- (1) the drilling authorization number;
- (2) a description, in chronological order, of the work carried out and the time required to carry out each step of the work;
- (3) the name and contact information of the enterprises that carried out the work;
- (4) the measured depth reached during the day;
- (5) the composition of the drilling fluid and the flushing fluid and the volumes used;
- (6) the working condition of the blowout prevention system;
- (7) a loss of circulation;
- (8) the components used to assemble the drill strings;
- (9) the specifications of the casing and its setting depth;
- (10) the weight applied to the bit and its penetration rate;
- (11) the measurements of the deviation of the well path in dip, azimuth and depth;
- (12) traces of petroleum or water detected;
- (13) the type of pump used for the cementing and its capacity;
- (14) the type of cement used, its density, its additives and their proportions, the setting time and the volume used;
- (15) the well loggings carried out;
- (16) the observations and data related to the evaluation or characterization of the geological formation;
- (17) the fluid samples collected;
- (18) the results of the pressure and leak tests;
- (19) the volume and composition of the gas used, released, incinerated or burnt at the flare;
- (20) the composition, concentration and detailed assessment of all the products stored and used on the site;
- (21) the operational problems encountered and the corrective measures taken or planned;

(22) the indication of any temporary work interruption and the procedure followed to secure the stratigraphic survey;

(23) the indication of any event that disrupted the planned progress of the work; and

(24) any other information or document deemed necessary by the Minister.

170. The authorization holder must send to the Minister, every Monday, the daily reports of the preceding week until the end of the drilling or re-entry work. If the Monday is a holiday, the report is sent on the first working day that follows.

171. The authorization holder must send to the Minister, within the period provided for in section 100 of the Act starting from the rig release, a completion report signed by an engineer including, in particular,

(1) the drilling authorization number;

(2) the name and contact information of the licence holder;

(3) the name and contact information of the enterprises that carried out the work;

(4) the coordinates of the well collar on a plan provided by a land surveyor according to the NAD83 map reference system;

(5) the measurements of the deviation of the well path in dip, azimuth and depth, and the final coordinates of the bottom of the hole;

(6) the start and end dates of the work;

(7) a summary of the work carried out in chronological order;

(8) a report on the cementing operations for each of the casing strings, containing, in particular,

(a) the name and contact information of the enterprise that carried out the cementing work;

(b) the type of cementing unit used and the method for applying the cement;

(c) the type of cement used, its density, its additives and their proportions, the setting time and the volume used;

(d) the cemented interval;

(e) the composition and volume of the flushing fluid and the spacing fluid used;

(f) the circulation pressures;

(g) the propping pressure applied and the duration; and

(h) a description of the cement return, the quantity and the retreat; if no return is observed, a description of the corrective actions taken;

- (9) the analysis results and the analysis certificates of the samples and fluid samples collected;
- (10) the interpreted well loggings, re-set in actual vertical depth, and the corrections made;
- (11) the demonstration that the centralization of the casings complies with the Industry Recommended Practice, IRP: # 25, Primary Cementing, published by the Drilling and Completion Committee;
- (12) the measured temperature and pressure to the final depth of the well;
- (13) the data, recordings, results of the drill-stem tests, pressure and leak tests and other tests and their interpretation;
- (14) a geological description of the cuttings and drill cores, and a geotechnical description of the drill cores;
- (15) a comparative analysis of the work carried out compared with that provided for in the technical program and the results obtained compared with those anticipated;
- (16) the elements and practices that the holder intends to adopt and the parameters the holder intends to adjust from a standpoint of continued improvement for the holder's future drilling work, determined in compliance with the Industry Recommended Practice, IRP: # 25, Primary Cementing, published by the Drilling and Completion Committee;
- (17) the list of the drill bits used, their type and the number of metres drilled by each;
- (18) a technical description of the condition of the well after the drilling;
- (19) the well classification determined according to Schedule 1;
- (20) a longitudinal section of the well, according to the measured depth and the actual vertical depth, signed and sealed by an engineer, indicating, in particular,
 - (a) intersected groups, geological formations, lithological contacts and faults;
 - (b) zones of abnormal pressure;
 - (c) the diameter of the drill hole and the diameters of each of the casings and the guide tube;
 - (d) the location of each of the casings and the guide tube;
 - (e) if applicable, the depth interval of the open-hole well; and
 - (f) the other equipment installed or dropped in the well and not recovered;
- (21) the daily tour reports;
- (22) if laboratory testing has been done on the cement after the granting of the authorization, the properties of the cement determined in the laboratory;
- (23) the technical reports prepared by the enterprises that carried out the work;

- (24) the type of play encountered and a comparison with a similar oil zone; and
- (24) photographs of the entire site after the drilling work.

CHAPTER VIII

COMPLETION

DIVISION I

CONDITIONS FOR OBTAINING AN AUTHORIZATION

172. A licence holder who wishes to obtain a completion authorization must apply to the Minister, in writing, at least 45 days before the start of the completion work planned.

173. The application must contain

- (1) the name and contact information of the holder and the licence number;
- (2) the name and number of the well; and
- (3) the work schedule and an estimate of the realization costs.

174. The application must be accompanied by

- (1) the completion technical program provided for in section 175 signed and sealed by an engineer;
- (2) a demonstration that the distances provided for in sections 179 and 180 are met;
- (3) payment of the fee of \$2,555; and
- (4) any other information and document requested by the Minister.

175. The completion technical program must contain

- (1) the name and contact information of the engineer responsible for the technical program;
- (2) the name, profession and functions of the persons who prepared and revised the program;
- (3) the well classification determined according to Schedule 1;
- (4) a chronological and detailed description of the work to be carried out;
- (5) the name and contact information of the enterprises charged with carrying out the work;
- (6) a longitudinal section of the well indicating the technical elements;
- (7) the type of service device, equipment, components and casings to be used and their specifications;

- (8) the demonstration that the equipment, components and casings may withstand the different stresses to which they will be submitted, in particular, bursting, collapse and tension stresses;
- (9) the demonstration that the local and regional geology and the presence of adjacent drill holes have been taken into consideration in the preparation of the program;
- (10) the measures taken to ensure the integrity of the well;
- (11) the type of completion;
- (12) the degree of primary, secondary or tertiary petroleum recovery;
- (13) the geological formations intersected and the depth of the intervals of each of the completion operations, in actual vertical depth and in measured depth;
- (14) the nature, composition and concentration of the fluids used and the total volume expected during the completion work;
- (15) the demonstration that the fluid injection pressure will not reach the pressure for fracturing geological formations;
- (16) the anticipated volume and flow of flow-back water;
- (17) the type of seals installed and the installation depths;
- (18) a casing perforation program indicating, in particular, the number and the type of perforations;
- (19) the list of the planned well loggings;
- (20) the list of expected pressure and leak tests;
- (21) the list of expected injectivity tests;
- (22) the measures planned for the management of petroleum, formation fluids, drilling fluids, chemical substances and other discharges;
- (23) if a simulation or modelling has been carried out, a description of the simulation or modelling and the results obtained; and
- (24) the list of references consulted during the preparation of the technical program, in particular, the standards from recognized organizations and guidelines from other Canadian jurisdictions.

Where work is planned in a temporarily closed well, the holder must, before it is carried out, inspect the site and the wellhead, maintain the wellhead and carry out a pressure and leak test. In that case, the technical program must also contain the annual inspection worksheet provided for in Schedule 2.

DIVISION II**TIME PERIODS AND NOTICE OF THE START OF THE WORK**

176. The authorization holder must, within 12 months after the granting of the authorization, start the completion work.

The work is deemed to have started as soon as the first step provided in the work schedule is initiated.

177. The authorization holder must notify the Minister, in writing, at least 7 days before the expected date for the start of the work

Where the holder cannot comply with the date, the holder must as soon as possible notify the Minister, in writing, indicating the reasons justifying the delay. The holder must also notify the Minister, in writing, of the new expected date for the start of the work if the date is expected within 7 days of the first notice of delay or of the holder's intent not to proceed.

SECTION III**CONDITIONS OF EXERCISE**

178. The authorization holder must comply with the technical program.

The holder may modify the program by sending to the Minister a supplementary agreement signed and sealed by an engineer stating the nature of the modification and the reasons justifying it. The supplementary agreement must be sent to the Minister before carrying out the work covered by the agreement. If it is urgent to modify the technical program for safety or work quality purposes, the holder must immediately send the agreement to the Minister and justify the urgency.

179. The authorization holder may not carry out completion work in a well whose collar is at a distance less than those provided for in section 133.

The distances must be measured horizontally, in a straight line, from the collar to the nearest point of the elements referred to in the first paragraph of section 133.

The Minister may allow the reduction of the distances if the authorization holder demonstrates to the Minister that an effective protective measure reduces risks.

The distances provided for in the first paragraph do not apply with respect to buildings belonging to the authorization holder or used for the work.

180. The authorization holder may not position the activity site less than 60 m from a national park or a protected area entered in the protected area register provided for in section 5 of the Natural Heritage Conservation Act

181. Before the start of the completion operations, the authorization holder must carry out pressure and leak tests on the casings, the strings that will be acted upon, the valve, injection and wellhead pipes and any other component that was not submitted to a pressure and leak test. The tests must be carried out at a pressure that allows confirmation of the integrity of the components where they are submitted to the maximum pressure provided for in the technical program.

The integrity is confirmed and the authorization holder may start the completion operations if the stabilized pressure is at least 90% of the pressure applied over a minimum interval of 10 minutes.

182. The authorization holder must ensure that the pressure applied during the completion work does not exceed the test pressure.

183. The authorization holder must ensure that

- (1) each completion interval is isolated from any other permeable or porous interval intersected by the well, except in the case of a commingled production;
- (2) any seal is installed as close as possible to the upper level of the completion interval;
- (3) no fracturing is induced to the formation during the work; and
- (4) the indicators and alarms associated with the monitoring equipment are installed on the service device to alert onsite personnel.

184. The authorization holder must install production tubing if the fluid withdrawn or injected is corrosive for the casings.

The authorization holder must design and install the casing and production tubing so as to comply with the Industry Recommended Practice, IRP: # 25, Primary Cementing, published by the Drilling and Completion Committee.

185. The cement used for cementing the production tubing must reach the minimum compressive strength of 3,500 kPa after 36 hours of hardening at the temperature of the shallowest formation to be covered.

The authorization holder must restrict the cement shrinkage process and limit to the minimum the risk of formation of a micro-annular space.

186. The authorization holder must use, until the end of the work, a blowout prevention system comprising at least 2 different sealing mechanisms or a wellhead designed to withstand the pressures provided for in the technical program.

187. The authorization holder must verify daily the blowout prevention system to make sure it works well. If a system component is defective, work must be suspended until the component is repaired.

188. The authorization holder must regularly inspect joints and structural elements of every equipment used to control the pressure to ensure the safe operation of the equipment.

The holder keeps and maintains a register of those inspections until the end of the work for the permanent closure of the well.

189. Before drilling the well casing, the authorization holder must wait until the cement reaches a resistance sufficient to not compromise the integrity of the well.

DIVISION IV

DAILY REPORT AND COMPLETION REPORT

190. The authorization holder must draw up a daily report on the work and keep it on the activity site.

The daily report must contain all the elements applicable to the declared day including, in particular,

- (1) the completion authorization number;
- (2) a description, in chronological order, of the work carried out and the time required to carry out each step of the work;
- (3) the name and contact information of the enterprises that carry out the completion work;
- (4) a summary of the meteorological conditions;
- (5) the result of all the pressure and leak tests, including their duration and the initial and final test pressures;
- (6) the working condition of the blowout prevention system;
- (7) the well loggings carried out;
- (8) the type of seals installed and the installation depths;
- (9) the technical details of the perforations, in particular, the number, type and intervals;
- (10) the technical details of the completion by chemical stimulation, if applicable, in particular, the intervals, concentrations and volumes of acids and additives injected, the volume of flow-back water and the flows, and the injection pressures;
- (11) the volume, composition and concentration of all the products stored and used on the site;
- (12) the number, interval, volume of fluid, injection rate and pressure and a summary of the results of each injectivity test;
- (13) the volume and composition of the gas used, released, incinerated or burnt at the flare;

- (14) the operational problems encountered and the corrective measures taken or planned;
 - (15) the indication of any event that disrupted the planned progress of the work;
 - (16) the indication of any temporary work interruption and the procedure followed to secure the well;
- and
- (17) any other information deemed necessary by the Minister.

191. The authorization holder must send to the Minister, every Monday, the daily reports of the preceding week until the end of the completion work. If the Monday is a holiday, the report is sent on the first working day that follows.

192. The authorization holder must send to the Minister, within the period provided for in section 100 of the Act, a completion report signed by an engineer including, in particular,

- (1) the completion authorization number;
- (2) the start and end dates of the work;
- (3) a summary of the work carried out according to their chronological order;
- (4) the start and end dates of the completion work;
- (5) a description of the condition of the well including a longitudinal section indicating the mechanical conditions of the well after the completion;
- (6) the classification of the well determined according to Schedule 1;
- (7) a description of the type of completion carried out and its degree of recovery, if applicable;
- (8) the results of the pressure and leak tests;
- (9) the intervals, the type of chemical completion, concentrations and volumes of acids and additives injected, the volume of flow-back water, injection rates and pressures;
- (10) the results of the injectivity tests;
- (11) the results of the other tests carried out;
- (12) the interpreted well loggings and the results of the related analyses and studies;
- (13) the analyses of recovered petroleum or water, if applicable;
- (14) the number, interval, type and pressure of each series of perforations;
- (15) the volume of flow-back water;

(16) a comparative analysis of the work carried out compared with that provided for in the technical program and the results obtained compared with those anticipated;

(17) the technical reports prepared by the enterprises that carried out the work; and

(18) if applicable, the other data collected during the completion work.

CHAPTER IX

FRACTURING

DIVISION I

CONDITIONS FOR OBTAINING AN AUTHORIZATION

193. A licence holder who wishes to obtain a fracturing authorization must apply to the Minister, in writing, at least 60 days before the planned start of the work.

194. The application must contain

- (1) the name and contact information of the holder and the licence number;
- (2) the name and number of the well; and
- (3) the work schedule and an estimate of the realization costs.

195. The application must be accompanied by

- (1) the fracturing technical program provided for in section 196 signed and sealed by an engineer;
- (2) a demonstration that the distances provided for in sections 201 and 202 are met;
- (3) payment of the fee of \$2,555; and
- (4) any other information and document requested by the Minister.

196. The fracturing technical program must contain

- (1) the name and contact information of the engineer responsible for the technical program;
- (2) the name, profession and functions of the persons who prepared and revised the program;
- (3) the name and contact information of the enterprises charged with carrying out the work;
- (4) a chronological and detailed description of the work to be carried out;
- (5) the classification of the well determined according to Schedule 1;
- (6) a longitudinal section of the well indicating the technical elements;

- (7) an interpreted logging of the quality of the cement bond or any other equivalent analysis of the evaluation of the production tubing or the intermediate casing, from the shallowest zone targeted containing petroleum to the top of the cement, that shows that the hydraulic isolation has been obtained;
- (8) the list of well loggings planned;
- (9) the list of pressure and leak tests and any other tests planned;
- (10) the list of fracturing tests planned, or the reasons why they are not required;
- (11) the type of service device, equipment, components and casings to be used and their specifications;
- (12) an evaluation of well integrity compliant with the Industry Recommended Practice, IRP: # 24, Fracture stimulation, published by the Drilling and Completion Committee indicating, in particular,
 - (a) the identification of the primary protective barrier and, if applicable, the secondary protective barrier;
 - (b) the maximum pressure to be used to avoid compromising the integrity of the well; and
 - (c) that the equipment, components and casings may withstand the conditions, forces and stresses to which they will be submitted;
- (13) a description of the fracturing intervals expected, in particular, the location of the perforations, in actual vertical depth and measured depth;
- (14) the number of steps planned;
- (15) the nature and total volume of the fracturing fluids anticipated at each step;
- (16) the pressures and fluid flows anticipated for pumping at each step;
- (17) the type of fractures;
- (18) the quantity of energy used for pumping at each fracturing step;
- (19) a fracturing parameter monitoring program including, in particular,
 - (a) the surface injection pressure;
 - (b) the fluid flow;
 - (c) the concentration of proppant; and
 - (d) if applicable, the pressure in the annular space between the primary and secondary protective barriers;

- (20) a well integrity monitoring program including, in particular,
- (a) the changes in the well characteristics likely to indicate a weakness of the casings or any other aspect of the well integrity necessary for the isolation of the usable groundwater;
 - (b) a well casing corrosion monitoring program; and
 - (c) the analyses to be carried out concerning the flows of the surface casing blowholes and the migration of the gas;
- (21) the following information concerning the fracturing fluids used:
- (a) the commercial name of all the additives and their function;
 - (b) the maximum concentration of each additive and of each additive in the fracturing fluid;
- (22) an evaluation of the risks related to the presence of additives in the fracturing fluids and the practices and operational audits provided for the management of the risks and including, in particular,
- (a) the physical, chemical and toxicological properties of the additives in the fracturing fluid;
 - (b) the classification of the additives based on their chemical ingredients and their potential impact on the safety and health of persons;
 - (c) the identification of the additives for which specific verifications or practices are required to reduce the risks on the safety and health of persons; and
 - (d) the nature of the specific verifications and practices planned;
- (23) an evaluation of the propagation of the fractures including, in particular, an analysis of the communication potential between the stimulated well and the adjacent drilling holes carried out in compliance with the Industry Recommended Practice, IRP: # 24, Fracture stimulation, published by the Drilling and Completion Committee, by using the relevant data to which the holder has access;
- (24) an evaluation of the capacity of the geological formations located between the petroleum zone and the base of the usable groundwater aquifer to act as a confining layer and contain the effects of the fracturing, or the reasons why it is not required; if applicable, the evaluation must contain, in particular,
- (a) an analysis of the mobility of the fracturing fluid in the zone located between the petroleum zone and the base of the usable groundwater;
 - (b) an analysis of the location and extent of the geological faults and the zones comprising natural fractures; and
 - (c) an analysis distance covering double the half length of the fracture planned on the entire depth of the drill hole;

- (25) a seismicity analysis based, in particular, on
- (a) the normal local and regional seismic activity determined from the historical data available;
 - (b) the pre-existing geological constraints near the fracturing work contemplated;
 - (c) the evaluation of the risk of seismicity induced by the fracturing work; and
 - (d) the evaluation of the probability that an induced earthquake of a magnitude greater than normal occurs;
- (26) the measures planned for the management of petroleum, formation fluids, drilling fluids, chemical substances and other discharges;
- (27) if a simulation or modelling has been carried out, a description of the simulation or modelling and the results obtained; and
- (28) the list of references consulted during the preparation of the technical program, in particular, the standards from recognized organizations and guidelines from other Canadian jurisdictions.

Where the holder observes a probability of an induced seismicity of a magnitude greater than the normal seismic activity, the technical program must also contain a plan for the monitoring, mitigation and response to the induced seismicity including, in particular,

- (1) a quality and quantity monitoring plan that covers a radius of 10 km from the fracturing zone, including, in particular,
- (a) a map of the temporary or permanent seismic monitoring equipment stations;
 - (b) the specifications of the seismic monitoring equipment, the data transmission method and their accuracy in measuring the location, depth and magnitude of a seismic activity;
 - (c) the monitoring procedure, identification of the persons responsible and the speed of the detection and location of an earthquake and the communication of the information; and
 - (d) a monitoring period comprised between the start of the work and the shortest of the following periods:
 - i. 60 days after the end of the fracturing work;
 - ii. the end of the return of the flow-back water to the surface; and
- (2) the measures applicable if the recorded magnitude of the induced seismic activity exceeds those provided for in section 212.

Where work is planned in a temporarily closed well, the holder must, before it is carried out, inspect the site and the wellhead, maintain the wellhead and carry out a pressure and leak test. In that case, the technical program must also contain the annual inspection worksheet provided for in Schedule 2.

197. If a licence holder applies for a fracturing authorization 5 years or more after the initial cementing of the well casing, the holder must also provide in the technical program a demonstration that the cementing of the well and casings used are in good condition, in particular, to preserve the integrity of the well during the fracturing work.

DIVISION II

TIME PERIODS AND NOTICE OF THE START OF THE WORK

198. The authorization holder must, within 12 months after the granting of the authorization, start the fracturing work.

The work is deemed to have started as soon as the first step provided in the work schedule is initiated.

199. The authorization holder must, at least 7 days before, notify the Minister of the start of the fracturing work.

Where the holder cannot comply with the date, the holder must as soon as possible notify the Minister, in writing, indicating the reasons justifying the delay. The holder must also notify the Minister, in writing, of the new expected date for the start of the work if the date is expected within 7 days of the first notice of delay or of the holder's intent not to proceed.

DIVISION III

CONDITIONS OF EXERCISE

200. The authorization holder must comply with the technical program.

The holder may modify the program by sending to the Minister a supplementary agreement signed and sealed by an engineer stating the nature of the modification and the reasons justifying it. The supplementary agreement must be sent to the Minister before carrying out the work covered by the agreement. If it is urgent to modify the technical program for safety or work quality purposes, the holder must immediately send the agreement to the Minister and justify the urgency.

201. The authorization holder may not carry out fracturing work in a well whose collar is at a distance less than those provided for in section 133.

The distances must be measured horizontally, in a straight line, from the collar to the nearest point of the elements referred to in the first paragraph of section 133.

The Minister may allow the reduction of the distances if the authorization holder demonstrates to the Minister that an effective protective measure reduces risks.

The distances provided for in the first paragraph do not apply to buildings belonging to the authorization holder or used for the work.

202. The authorization holder may not position the activity site less than 60 m from a national park or a protected area entered in the protected area register provided for in section 5 of the Natural Heritage Conservation Act.

203. The casings, components and equipment used by the authorization holder must be designed, built, tested, maintained or used so as to ensure the integrity of the well during the fracturing work.

The surface casing and the cement forming it are not protective barriers and must not be exposed to pressures created by the fracturing work.

204. Where the authorization holder holds an exploration licence, the casings, components and equipment the holder uses must be designed so as to serve as primary and secondary protective barriers during the fracturing work.

The Minister may exempt the holder from that requirement if the holder demonstrates to the Minister that the protections in place are sufficient.

205. Before the start of the fracturing operations, the authorization holder must carry out pressure and leak tests on the casings, the strings that will be acted upon, the valve, injection and wellhead pipes and any other component that will be acted upon that was not submitted to a pressure and leak test. The tests must be carried out at a pressure that allows confirmation of the integrity of the components where they are submitted to the maximum pressure provided for in the technical program.

The integrity is confirmed and the holder may start the fracturing operations if the stabilized pressure is at least 90% of the pressure applied over a minimum interval of 10 minutes.

206. Before the start of the fracturing operations, the authorization holder must carry out at least 1 fracturing test.

The Minister may exempt the holder from that requirement if the holder demonstrates to the Minister that a test in the same geological formation has already been carried out in the same conditions.

207. The authorization holder must use, until the temporary or permanent stop of the fracturing work, a blowout prevention system comprising at least 2 different sealing mechanisms or a wellhead designed to withstand the anticipated pressures.

208. The authorization holder must verify daily the blowout prevention system to make sure it works well. If a system component is defective, work must be suspended until the component is repaired.

209. The authorization holder must regularly inspect joints and structural elements of every equipment used to control the pressure to ensure the safe operation of the equipment.

The holder keeps a register of those inspections and maintains it until the end of the work for the permanent closure of the well.

210. The authorization holder must ensure that the indicators and alarms associated with the monitoring equipment are installed on the service device to alert onsite personnel.

211. The authorization holder must, if applicable, keep the plan for the monitoring, mitigation and response to an induced seismicity at all times on the activity site.

212. If an earthquake of a 2.0 magnitude or more is detected and the epicentre is located within a radius of 10 km from the fracturing zone, the authorization holder must implement a monitoring, mitigation and response plan so as to eliminate or reduce the possibility of other seismic events resulting from the fracturing operations.

If an earthquake of a 4.0 magnitude or more is detected and the epicentre is located within a radius of 10 km from the fracturing zone, the holder must immediately interrupt the fracturing work and secure the well.

The holder immediately sends an incident notice to the Minister.

213. Following an interruption provided for in the second paragraph of section 212, the authorization holder who wishes to resume fracturing work must submit to the Minister, for approval, a supplementary agreement to the holder's technical program to reduce future induced seismicity at a local magnitude of less than 4.0.

The holder resumes the work when the holder implements the corrective measures to the Minister's satisfaction.

DIVISION IV

DAILY REPORT AND COMPLETION REPORT

214. The authorization holder must draw up a daily report of the work and keep it on the activity site.

The daily report must contain all the elements applicable to the declared day including, in particular,

- (1) the fracturing authorization number;
- (2) the square-drive bushing;
- (3) a description, in chronological order, of the work carried out and the time required for carrying out each step;
- (4) the name and contact information of the enterprises carrying out the fracturing work;
- (5) a summary of the meteorological conditions;
- (6) the result of the pressure and leak tests, including the duration and the initial and final test pressures;
- (7) the working condition of the blowout prevention system;
- (8) the well loggings carried out;
- (9) the type of seals installed and the installation depths;

- (10) the volume, composition and concentration of all the products stored and used on the site;
- (11) the volume, duration, flow and composition of the flow-back water;
- (12) the number, interval, volume of fluid, injection flow and pressure and a summary of the results of the fracturing tests;
- (13) the measurements of the extension and orientation of induced fractures;
- (14) the volume and composition of the gas used, released, incinerated or burnt at the flare;
- (15) the operational problems encountered and the corrective measures taken or planned;
- (16) the indication of any event that disrupted the planned progress of the work;
- (17) the indication of any temporary interruption of the fracturing work and the procedure followed to secure the well; and
- (18) any other information or document deemed necessary by the Minister.

215. The authorization holder must send to the Minister, every Monday, the daily reports of the preceding week until the end of the fracturing work. If the Monday is a holiday, the report is sent on the first working day that follows.

216. The authorization holder must send to the Minister, within the period provided for in section 100 of the Act, a completion report signed by an engineer including, in particular,

- (1) the fracturing authorization number;
- (2) the start and end dates of the work;
- (3) a summary of the work carried out according to the chronological order;
- (4) a description of the condition of the well including a longitudinal section indicating the mechanical conditions of the well after the fracturing;
- (5) the classification of the well determined according to Schedule 1;
- (6) the result of the pressure and leak tests, including their duration, and the initial and final test pressures;
- (7) the results of the fracturing tests including, in particular,
 - (a) the number and duration of the tests;
 - (b) the volumes and flows of the injected fluid per test;
 - (c) the measured pressure on the surface and at the bottom of the well;
 - (d) the test interval, in metre of measured depth;

- (e) the formation temperature;
- (f) the indication of the presence of flow-back water or a fracture that closed up by natural leakage;
- (g) the indication of any problem encountered and its potential impact on the test results;
- (h) the interpretation and analysis of the test results, including, in particular,
 - i. the measured constraints;
 - ii. a description and justification of the analysis and interpretation techniques; and
 - iii. the identification and analysis of any unexpected result; and
- (i) the raw test data, in particular,
 - i. the date of the test;
 - ii. the test depth, in metre of measured depth; and
 - iii. the test data, including the time elapsed, the wellhead pressure, the pressure at the bottom of the well, the injection flow, the blow-back pressure and the temperature;
- (8) the number, interval, type and pressure of each series of perforations;
- (9) the start and end dates of each fracturing step;
- (10) the maximum and average processing flow of each fracturing step;
- (11) the maximum and average processing pressure of each fracturing step;
- (12) the duration of the return of the flow-back water to the surface, the total volume recovered, the average flow and the composition;
- (13) a comparative analysis of the work carried out compared with that provided for in the technical program and the results obtained compared with those anticipated;
- (14) the flow-back volume estimating the volume of injected fluid and the volume that remained in the formation;
- (15) the interpreted well loggings and the results of the related analyses and studies;
- (16) the analyses of the petroleum or water recovered, if applicable;
- (17) the data collected during the fracturing work, in particular, the fracturing parameter monitoring data;
- (18) if applicable, the raw and interpreted seismic monitoring data;
- (19) the comparative analysis of the reaction of the geological formations compared to the reaction anticipated;

- (20) the technical reports prepared by the enterprises that carried out the work;
- (21) the follow-up after an incident referred to in sections 217 and 218; and
- (21) if applicable, the other data collected during the fracturing activities.

DIVISION V

NOTICE TO THE MINISTER

217. The authorization holder must immediately notify the Minister where any of the following incidents occurs:

- (1) the maximum pressure provided for in the technical program is exceeded;
- (2) the volume of fluid rising to the surface exceeds the volume anticipated;
- (3) the holder has reasons to suspect a flaw in the casing or the casing cement, or the absence of isolation of a source of usable groundwater.

218. When the authorization holder observes an involuntary entry of any formation fluid inside an adjacent drill hole, the authorization holder must immediately notify the person responsible for the drill hole and the Minister.

CHAPTER X

RECONDITIONING

DIVISION I

CONDITIONS FOR OBTAINING AN AUTHORIZATION

219. A licence holder who wishes to obtain a reconditioning authorization must apply to the Minister, in writing, at least 45 days before the planned start of the work.

220. The application must contain

- (1) the name and contact information of the holder and the licence number;
- (2) the well name, number and type; and
- (3) the work schedule and an estimate of the realization costs.

221. The application must be accompanied by

- (1) the reconditioning technical program provided for in section 222 signed and sealed by an engineer;
- (2) payment of the fee of \$4,426; and
- (3) any other information and document requested by the Minister.

222. The reconditioning technical program must contain

- (1) the name and contact information of the engineer responsible for the technical program;
- (2) the name, profession and functions of the persons who prepared and revised the program;
- (3) a chronological and detailed description of the work to be carried out;
- (4) the classification of the well determined according to Schedule 1;
- (5) the name and contact information of the enterprises charged with carrying out the work;
- (6) the demonstration that the regional and local geology and the presence of adjacent drill holes have been taken into consideration;
- (7) the reasons justifying the reconditioning;
- (8) the purpose of the reconditioning;
- (9) a longitudinal section of the well indicating the technical elements;
- (10) the list of pressure and leak tests, and the list of other tests planned;
- (11) the list of well loggings planned;
- (12) the type of service device and equipment to be used and their specifications;
- (13) the intervals to be the subject of reconditioning;
- (14) a description of the fluids used;
- (15) the pressure at the closed wellhead and the shut-in pressure of the well;
- (16) the demonstration that the equipment, components and casings may withstand the different stresses to which they will be submitted, in particular, bursting, collapse and tension stresses;
- (17) if applicable, a cementing program including, in particular,
 - (a) the type of cementing;
 - (b) the cementing intervals;
 - (c) the method for applying the cement;
 - (d) the type of cement, its density, its additives and their proportions, the setting time, the flow and pressure used and the volume that remained in the well and the volume that rose to the surface;
 - (e) if applicable, the maximum pressure for injecting the cement; and
 - (f) the changes to the cement required, if applicable, due to specific physical and chemical conditions of the environment, or to give the cement specific properties;

- (18) a well integrity verification and follow-up program;
- (19) any specific condition that could affect the safety of the work on the well;
- (20) an evaluation of the impact of the proposed work on the optimal recovery of the resource; and
- (21) the list of references consulted during the preparation of the technical program, in particular, the standards from recognized organizations and guidelines from other Canadian jurisdictions.

Where work is planned in a temporarily closed well, the holder must, before it is carried out, inspect the site and the wellhead, maintain the wellhead and carry out a pressure and leak test. In that case, the technical program must also contain the annual inspection worksheet provided for in Schedule 2.

DIVISION II

TIME PERIODS AND NOTICE OF THE START OF THE WORK

223. The authorization holder must, within 12 months after the granting of the authorization, start the reconditioning.

The work is deemed to have started as soon as the first step provided in the work schedule is initiated.

224. The authorization holder must, at least 7 days before, notify the Minister of the start date of the reconditioning.

Where the holder cannot comply with the date, the holder must as soon as possible notify the Minister, in writing, indicating the reasons justifying the delay. The holder must also notify the Minister, in writing, of the new expected date for the start of the work if the date is expected within 7 days of the first notice of delay or of the holder's intent not to proceed.

DIVISION III

CONDITIONS OF EXERCISE

225. The authorization holder must comply with the technical program.

The holder may modify the program by sending to the Minister a supplementary agreement signed and sealed by an engineer stating the nature of the modification and the reasons justifying it. The supplementary agreement must be sent to the Minister before carrying out the work covered by the agreement. If it is urgent to modify the technical program for safety or work quality purposes, the holder must immediately send the agreement to the Minister and justify the urgency.

226. The authorization holder must carry out the reconditioning so as to

- (1) ensure the safety of the work;
- (2) not compromise the capacity of the well to withstand potential conditions, forces and stresses;
- (3) ensure a sufficient resistance to fluid kicks;

- (4) protect the integrity of the usable groundwater; and
- (5) ensure that the petroleum zones and the aquifer layers are isolated from one another.

227. The authorization holder must use, until the temporary or permanent stop of the work, a blowout prevention system comprising at least 2 different sealing mechanisms or a wellhead designed to withstand the pressures provided for in the technical program.

228. The authorization holder must verify daily the blowout prevention system to make sure it works well. If a system component is defective, work must be suspended until the component is repaired.

229. The authorization holder must regularly inspect joints and structural elements of every equipment used to control the pressure to ensure the safe operation of the equipment.

The holder keeps and maintains a register of those inspections until the end of the work for the permanent closure of the well.

230. The authorization holder must ensure that the indicators and alarms associated with the monitoring equipment are installed on the service device to alert onsite personnel.

DIVISION IV

DAILY REPORT AND COMPLETION REPORT

231. The authorization holder must draw up a daily report of the work and keep it on the activity site.

The daily report must contain all the elements applicable to the declared day including, in particular,

- (1) the reconditioning authorization number;
- (2) the square-drive bushing;
- (3) a description, in chronological order, of the work carried out and the time required for carrying out each step;
- (4) the name and contact information of the enterprises carrying out the reconditioning;
- (5) a summary of the meteorological conditions;
- (6) the result of the pressure and leak tests, including the duration and the initial and final test pressures;
- (7) the result of any other test carried out;
- (8) the working condition of the blowout prevention system;
- (9) the well loggings carried out;
- (10) the type of seals installed and the installation depths;

- (11) the volume, composition and concentration of the reconditioning fluids;
- (12) the volume and composition of the gas used, released, incinerated or burnt at the flare;
- (13) the operational problems encountered and the corrective measures taken or planned;
- (14) the indication of any event that disrupted the progress of the work;
- (15) the indication of any temporary interruption of the reconditioning work and the procedure followed to secure the well; and
- (16) any other information or document deemed necessary by the Minister.

232. The authorization holder must send to the Minister, every Monday, the daily reports of the preceding week until the end of the reconditioning work. If the Monday is a holiday, the report is sent on the first working day that follows.

233. The authorization holder must send to the Minister, within the period provided for in section 100 of the Act, a completion report signed by an engineer including, in particular,

- (1) the reconditioning authorization number;
- (2) the start and end dates of the work
- (3) a summary of the work carried out according to the chronological order;
- (4) a description of the condition of the well including a longitudinal section indicating the mechanical conditions of the well after the reconditioning;
- (5) the classification of the well determined according to Schedule 1;
- (6) the result of the pressure and leak tests, including their duration, and the initial and final test pressures;
- (7) the result of any other test carried out;
- (8) a comparative analysis of the work carried out compared with that provided for in the technical program and the results obtained compared with those anticipated;
- (9) the interpreted well loggings and the results of the related analyses and studies;
- (10) the technical reports prepared by the enterprises that carried out the work; and
- (11) if applicable, the other data collected during the reconditioning activities.

CHAPTER XI**PETROLEUM EXTRACTION TESTS AND USE OF AN UNDERGROUND RESERVOIR****DIVISION I****PETROLEUM EXTRACTION TEST PROGRAM**

234. An exploration licence holder who wishes to carry out petroleum extraction tests must submit a petroleum extraction test technical program, for approval, to the Minister at least 30 days before the expected date for the start of the installation of the equipment needed.

235. The test technical program must be signed and sealed by a geologist or an engineer and contain

- (1) the name and contact information of the holder and the licence number;
- (2) the name and number of the well;
- (3) the planned duration of the tests and an estimate of the realization costs;
- (4) the name and contact information of the geologist or engineer responsible for the tests;
- (5) a chronological and detailed description of the tests to be carried out;
- (6) the classification of the well determined according to Schedule 1;
- (7) the name and contact information of the enterprise charged with carrying the tests;
- (8) the depth interval and a description of the geological formations and the zones subject to the tests;
- (9) the geological, geophysical, petrophysical and hydrostatic information and the drilling results justifying the tests;
- (10) a description of the current condition of the well;
- (11) if a seismic profile has been carried out, the interpreted profile indicating the location of the zones subject to the tests;
- (12) the methods planned to dispose of the substances extracted; and
- (13) any other information or document deemed necessary by the Minister.

DIVISION II**UNDERGROUND RESERVOIR TRIAL TEST PROGRAM**

236. An exploration licence holder who wishes to carry out trial tests must submit an underground reservoir trial test technical program for approval to the Minister at least 30 days before the expected start date of the installation of the necessary equipment.

237. The test technical program must be signed and sealed by a geologist or an engineer and contain

- (1) the name and contact information of the holder and the licence number;
- (2) the name and number of the well;
- (3) the planned duration of the tests and an estimate of the realization costs;
- (4) the name and contact information of the geologist or engineer responsible for the tests;
- (5) a chronological and detailed description of the tests to be carried out;
- (6) the classification of the well determined according to Schedule 1;
- (7) the name and contact information of the enterprise charged with carrying out the tests;
- (8) a description of the underground reservoir subject to the tests;
- (9) the geological, geophysical, petrophysical and hydrostatic information and the drilling results justifying the tests;
- (10) a description of the current condition of the wells;
- (11) at least 3 interpreted seismic profiles indicating the location in the subsurface of the underground reservoir subject to the tests and the well seismic cushioning;
- (12) the estimated capacity of the underground reservoir on the basis of a modelling;
- (13) the shut-in pressure of the underground reservoir recorded at the well subject to the tests;
- (14) the nature and properties of the substances stored or disposed of in the underground reservoir during the test period;
- (15) the injection method and the volume and pressure of the substances injected in the underground reservoir during the tests;
- (16) the methods planned for disposing of the substances withdrawn; and
- (17) any other information or document deemed necessary by the Minister.

DIVISION III

TIME PERIODS AND NOTICE OF THE START OF THE WORK

238. An exploration licence holder who carries out petroleum extraction tests or underground reservoir trial tests must, at least 7 days before the expected start date of the installation work of the equipment necessary for that purpose, notify the Minister in writing.

Where the holder cannot comply with the date, the holder must as soon as possible notify the Minister, in writing, indicating the reasons justifying the delay. The holder must also notify the Minister, in writing, of the new expected date for the start of the work if the date is expected within 7 days of the first notice of delay or of the holder's intent not to proceed.

DIVISION IV

CARRYING OUT OF PETROLEUM EXTRACTION TESTS AND UNDERGROUND RESERVOIR TRIAL TESTS

239. The maximum duration of a test period is 240 consecutive days for the petroleum extraction tests and 365 consecutive days for the underground reservoir trial tests.

The test period begins on the first day on which an exploration licence holder carries out petroleum extraction tests or underground reservoir trial tests and ends on the day on which the holder completely ceases to carry out the tests.

240. An exploration licence holder who carries out tests must comply with the test technical program approved by the Minister.

The holder may modify the program by sending to the Minister a supplementary agreement signed and sealed by a geologist or an engineer stating the nature of the modification and the reasons justifying it. The supplementary agreement must be sent to the Minister before carrying out the work covered by the agreement. If it is urgent to modify the technical program for safety or work quality purposes, the holder must immediately send the agreement to the Minister and justify the urgency.

241. An exploration licence holder who carries out tests must ensure that

- (1) the equipment used is designed so as to properly evaluate the formation;
- (2) the equipment rated pressure upstream of and including the well testing manifold exceeds the maximum anticipated shut-in pressure; and
- (3) the equipment downstream of the well testing manifold is sufficiently protected against overpressure.

DIVISION V

DAILY REPORT AND TEST END REPORT

242. An exploration licence holder who carries out petroleum extraction test or underground reservoir trial tests must draw up a daily report of the tests and keep it on the activity site.

The daily report must contain all the elements applicable to the declared day including, in particular,

- (1) the name and contact information of the holder and the licence number;
- (2) the volumes and flows of petroleum and other fluids extracted, injected, withdrawn and disposed of in the well;

- (3) the volume and composition of the gas used, released, incinerated or burnt at the flare;
- (4) the operational problems encountered and the corrective measures taken or planned;
- (5) the indication of any event that disrupted the progress of the work; and
- (6) any other information or document deemed necessary by the Minister.

243. An exploration licence holder who carries out tests must send to the Minister, every Monday, the daily reports of the preceding week until the end of the test period. If the Monday is a holiday, the report is sent on the first working day that follows.

244. An exploration licence holder who carries out tests must, within 30 days after the end of the test period, send to the Minister a test completion report signed by a geologist or an engineer including, in particular,

- (1) the name and contact information of the holder and the licence number;
- (2) a summary of the activities related to the tests;
- (3) a technical description of all the tests carried out;
- (4) the results obtained during the tests, in particular,
 - (a) the average daily pressures registered at the wellhead;
 - (b) the average daily flows measured;
 - (c) the volumes of fluids extracted, injected, withdrawn and disposed of;
 - (d) in the case of petroleum extraction tests, the decline curve, the deliverability curve of the well flow and the pressure rise curve;
 - (e) in the case of underground reservoir use tests, the deliverability decline curve and the pressure rise curve; and
 - (f) for a gas well, the absolute open-flow potential;
- (5) the realization cost of the tests carried out;
- (6) the methods used to dispose of the substances extracted;
- (7) the results of the analyses carried out including, in particular, the composition of the fluids extracted, injected, withdrawn and disposed of;
- (8) the classification of the well determined according to Schedule 1; and
- (9) the technical reports prepared by the enterprises that carried out the work.

CHAPTER XII**SPECIFIC REQUIREMENTS RELATING TO THE PRODUCTION****DIVISION I****PETROLEUM PRODUCTION TESTS**

245. A production licence holder must carry out production tests for all the wells that have not been subject to extraction tests so as to determine

- (1) the nature of the fluids therein;
- (2) the petroleum production capacity per day, in m³, and the volume of water associated with that production; and
- (3) the new geological, hydrostatic, petrophysical and geophysical characteristics of the pool.

246. A production licence holder must measure the shut-in pressure of the pool before and after the production test.

247. A production licence holder must carry out, every 3 months, a test in normal production conditions of a maximum duration of 24 hours for each well connected to a bank to determine the petroleum and water production rate.

The holder uses the results of those tests to allocate the monthly production of the bank between the various wells connected to it, if applicable.

On the application of the holder, the Minister may reduce the frequency of the tests. The holder's application must contain

- (1) the anticipated frequency of the tests and the method to be used;
- (2) a summary of the accuracy of the tests;
- (3) the reasons justifying the reduction of the frequency of the tests; and
- (4) any other information or document requested by the Minister.

The term "bank" means the storage facilities that receive the production from one or more wells and include the equipment for separating the petroleum from the other fluids and to measure them.

248. During the tests, a production licence holder must measure the pressure interference from one well to the other.

249. A production licence holder must notify the Minister, at least 7 days before, of the date and time planned for the carrying out of the tests.

250. A production licence holder must send to the Minister the results of the tests carried out and any other information deemed necessary by the Minister, within 30 days after the end of the tests.

DIVISION II

PRODUCING WELL

251. A production licence holder must carry out production loggings before ceasing operations of a producing well.

252. A production licence holder must, for each well in production during the year, measure its shut-in pressure during the first and last months of the year.

DIVISION III

PETROLEUM ENHANCED RECOVERY

253. A production licence holder who wishes to carry out a petroleum enhanced recovery project must submit an enhanced recovery technical program signed and sealed by an engineer for the approval of the Minister at least 30 days before the start of the work necessary for the project.

254. The enhanced recovery technical program must contain

- (1) the name and contact information of the holder and the licence number;
- (2) the name of the wells concerned by the project;
- (3) the classification of the wells determined according to Schedule 1;
- (4) a map at a scale sufficient to show the area in which the project must be carried out and the boundaries of the pool;
- (5) a diagram showing the wells and the well injection completion methods, if applicable;
- (6) a diagram showing the water injection, treatment and measuring installations and the configuration and rated working pressure of the pipes and equipment;
- (7) the anticipated method for controlling corrosion in the wells, collecting pipes and surface installations;
- (8) a geological and technical analysis including, in particular,
 - (a) a longitudinal section of the pool indicating the top and base of the reservoir and the distribution of the fluids;
 - (b) a map at a scale sufficient to show the characteristics of the reservoir, in particular, the structure of the top, the size of the pores and permeability capacity;
 - (c) production and total recovery forecasts;

- (d) the source of the injection fluid and a demonstration of its compatibility with the rocks and fluids of the reservoir;
- (e) the estimated injection rate of each of the injection wells and their injection pressure at the wellhead;
- (f) the recovery forecasts and simulation models, if applicable; and
- (g) the measured or estimated pressure of the reservoir in the area of the project and the pressure of the reservoir as part of the enhanced recovery;
- (9) the activities schedule, in particular, the drilling, completion and installation construction activities related to the project; and
- (10) any other information or deemed necessary by the Minister.

255. A production licence holder who carries out a petroleum enhanced recovery project must, at least 15 days before the expected date for the start of the petroleum enhanced recovery, notify the Minister in writing.

The holder also notifies the Minister 7 days before temporarily or permanently ceasing the activities by indicating the reasons justifying the cessation.

256. Before starting the injection in a directional or horizontal drilling, a production licence holder must carry out a diametrical well logging and send the interpreted diametrical well logging to the Minister.

The holder may start petroleum enhanced recovery if no deformity has been identified on the casing and if the well is clean.

CHAPTER XIII

AUTHORIZATION TO PRODUCE BRINE

DIVISION I

CONDITIONS FOR OBTAINING AN AUTHORIZATION

257. A licence holder who wishes to obtain an authorization to produce brine must apply to the Minister, in writing, at least 60 days before the expected date for the start of the production.

258. The application must contain

- (1) the name and contact information of the holder and the licence number;
- (2) the name and number of the well; and
- (3) the work schedule and an estimate of the realization costs.

259. The application must be accompanied by

- (1) the brine production program provided for in section 260 signed and sealed by an engineer;
- (2) payment of the fee of \$2,500;
- (3) payment of the annual fee for the first year; and
- (4) any other information or document requested by the Minister.

260. The brine production program must contain

- (1) the name and contact information of the engineer responsible for the program;
- (2) the name, profession and functions of the persons who prepared or revised the program;
- (3) the name and contact information of the enterprise charged with carrying out the work;
- (4) a longitudinal section of the well indicating the technical elements;
- (5) a general presentation of the production project including, in particular,
 - (a) a description of the manner in which the well will have to be adapted and the related installations planned;
 - (b) the list of licences, certificates and other authorizations to be obtained, if applicable;
 - (c) a description of the manner in which the brine will be treated, delivered and transported, if applicable; and
 - (d) a general description of the progress of the installations over time;
- (6) an economic evaluation of the project including, in particular,
 - (a) the market targeted, including the anticipated uses;
 - (b) an estimate of the production and its market value; and
 - (c) an estimate of the royalties to be paid;
- (7) the characterization of the brine including, in particular,
 - (a) a brine analysis certificate prepared from a characterization sampling performed by a hydrogeologist pertaining, in particular, to its pH, conductivity, turbidity, salinity, content in sodium, calcium, magnesium, potassium, hydrogen sulfide (H₂S), radon, methane, lead, mercury and arsenic, its content in chloride ion, bromide ion, sulfate ion and carbonate ion, and its content in petroleum; and
 - (b) the temperature of the brine at the well outlet;

- (8) a brine production, storage and transportation program including, in particular,
- (a) the process by which the brine will be extracted;
 - (b) the brine treatment method, in particular, its filtering and degassing, and the addition of additives;
 - (c) if applicable, the brine storage method including, in particular,
 - i. the type of tanks and lines to be used and their technical parameters; and
 - ii. the resistance to corrosion of the equipment; and
 - (d) the means of transportation and delivery of the brine; and
- (9) the list of references consulted during the preparation of the technical program, in particular, the standards from recognized organizations and guidelines from other Canadian jurisdictions.

Where work is planned in a temporarily closed well, the holder must, before it is carried out, inspect the site and the wellhead, maintain the wellhead and carry out a pressure and leak test. In that case, the technical program must also contain the annual inspection worksheet for temporarily closed wells provided for in Schedule 2.

DIVISION II

TIME PERIODS AND WORK NOTICE

261. The authorization holder must, within 24 months after the granting of the authorization by the Minister, start the production of brine.

262. The authorization holder must notify the Minister, in writing, at least 14 days before the expected start date for the construction of the infrastructures necessary for the production and at least 30 days before the start date of the production.

Where the holder cannot comply with the date, the holder must as soon as possible notify the Minister, in writing, indicating the reasons justifying the delay. The holder must also notify the Minister, in writing, of the new expected date for the start of the work if the date is expected within 14 or 30 days of the first notice of delay, as the case may be, or of the holder's intent not to proceed.

DIVISION III

CONDITIONS OF EXERCISE

263. The authorization holder must comply with the brine production program.

The holder may modify the program by sending to the Minister a supplementary agreement signed and sealed by an engineer stating the nature of the modification and the reasons justifying it. The supplementary agreement must be sent to the Minister before carrying out the work covered by the agreement. If it is urgent to modify the brine production program for safety or work quality purposes, the holder must immediately send the agreement to the Minister and justify the urgency.

264. The authorization holder must, as soon as the work starts, add on the sign installed in accordance with section 132, an indication that it is a well containing brine.

265. The authorization holder must regularly inspect joints, structural elements and every equipment used for the extraction, treatment, storage and transportation of the brine to ensure the safe operation of the equipment.

The holder keeps a register of those inspections and maintains it until the end of the work for the permanent closure of the well.

266. The annual fee payable by an authorization holder is \$722.

267. The Minister renews an authorization for a 5-year period, provided that the holder

- (1) pays the fee for the first year of renewal;
- (2) complied with the provisions of the Act and its regulations during the previous term;
- (3) demonstrates that he or she produced brine for at least 24 months during the previous term; and
- (4) demonstrates that the use approach allows optimal recovery of the brine.

The renewal application must be sent at least 60 days before the end of the previous term, failing which the holder is liable to the monetary administrative penalty provided for in paragraph 1 of section 187 of the Act.

268. An authorization to produce brine is transferable only in the case of the transfer of the licence of the authorization holder.

269. A person who wishes to obtain an authorization to produce brine already granted must apply to the Minister, in writing, at the same time as the application for the transfer of the licence.

The application must be accompanied by a supplementary agreement to the brine production program, if applicable.

DIVISION IV

MONTHLY REPORTS AND ROYALTIES

270. The authorization holder must draw up a monthly report of the work and keep it on the activity site.

The monthly report must contain, in particular,

- (1) the number of the authorization to produce brine;

- (2) the volume of brine extracted during the month, in m³;
- (3) the number of production days;
- (4) the monthly and cumulative costs for production, transportation and purification and the average retail selling price;
- (5) the wellhead value of the brine extracted;
- (6) the calculation of the royalty in accordance with section 272;
- (7) the operational problems encountered and the corrective measures taken or planned;
- (8) the indication of any event that disrupted the progress of the work; and
- (9) any other information or document deemed necessary by the Minister .

271. The authorization holder must send to the Minister, within the 25 first days of the following month, the monthly report, until the end of the period of validity of the authorization.

The monthly report is accompanied by the payment of the royalties on the brine extracted during the month concerned.

272. The authorization holder pays the following monthly royalties for the brine extracted from the well:

- (1) where the average daily production of the well is 300 m³ or less, 5% of the well head value of the brine extracted;
- (2) where the average daily production of the well is greater 300 m³ but less than 1,000 m³,
 - (a) 5% of the well head value of the brine extracted for the first 300 m³; and
 - (b) 10% of the well head value of the brine extracted on the excess; and
- (3) where the average daily production of the well is greater than 1,000 m³,
 - (a) 8.75% of the well head value of the brine extracted for the first 1,000 m³; and
 - (b) 12.5% of the well head value on the excess.

273. The royalties must be paid in cash, or by cheque or postal money order payable to the order of the Minister of Finance of Québec.

274. The royalties that are not paid within the prescribed period bear interest as of the date of the failure to pay, at the rate determined under section 28 of the Tax Administration Act (chapter A-6.002).

CHAPTER XIV WELL CLOSURE

DIVISION I TEMPORARY OR PERMANENT CLOSURE AUTHORIZATION

§1. Temporary closure authorization

§§1. Conditions for obtaining an authorization

275. A licence holder must temporarily close the well on the expiry of a period of 12 consecutive months without activity in the well. The Minister may, however, grant an additional period if the holder demonstrated that exceptional circumstances warrant it.

276. On request and after analysis of the annual report provided for in section 168, the Minister may, in the case of an observation well, exempt a licence holder from the requirement to temporarily close the well for the current year where the holder demonstrates the integrity of the well and justifies its use for monitoring the pool or the underground reservoir.

277. A licence holder who must obtain a temporary well closure authorization must apply to the Minister, in writing, at least 30 days before the start of the work.

278. The application must contain

- (1) the name and contact information of the holder and the licence number;
- (2) the name of the well; and
- (3) the work schedule and an estimate of the realization costs.

279. The application must be accompanied by

- (1) the temporary closure technical program provided for in section 280 signed and sealed by an engineer;
- (2) payment of the fee of \$2,058; and
- (3) any other information or document requested by the Minister.

280. The temporary closure technical program must contain

- (1) the name and contact information of the engineer responsible for the program;
- (2) the name, profession and functions of the persons who prepared or revised the program;
- (3) the classification of the risk potential of the well determined according to Schedule 4;
- (4) the condition of the well before the work for the temporary closure;

- (5) the classification of the well determined according to Schedule 1 ;
- (6) a chronological and detailed description of the work to be carried out;
- (7) a description of the activity site restoration work to maintain the quality of the natural landscape, minimize impact on wildlife and harmonize the activity site with the use of the territory, and a plan presenting the work including, in particular,
 - (a) the procedure for dismantling installations and, if applicable, the procedure for dismantling the supply cable;
 - (b) the rehabilitation of contaminated land;
 - (c) the purge of pipes; and
 - (d) the withdrawal of equipment and facilities;
- (8) the name and contact information of the enterprise charged with carrying out the work;
- (9) a longitudinal section indicating, in particular, the anticipated mechanical conditions of the well after the closure and the various geological formations intersected and their respective pressures;
- (10) the type of service device and equipment to be used and their specifications, in particular, the configuration of the wellhead and the surface casing blowhole;
- (11) the demonstration that, before carrying out the work for the temporary closure, the well did not present any risks within the meaning of the second paragraph of section 18 for the safety of persons and property, and environmental protection;
- (12) the type of plugs used and the anticipated depth intervals;
- (13) for each cement plug, the type of cement used, its density, its additives and their proportions, the setting time, calculated volume and surplus percentage;
- (14) the method for verifying the position of the plugs;
- (15) a program for the regular preventive maintenance of the well and the wellhead;
- (16) the list of the planned well loggings; and
- (17) the list of references consulted during the preparation of the technical program, in particular, the standards from recognized organizations and guidelines from other Canadian jurisdictions.

The classification provided for in subparagraph 3 of the first paragraph must be performed on the basis of the highest risk obtained according to the criteria. For a well with a number of areas, the classification must be performed on the basis of the highest risk obtained, aside from the areas that are permanently closed. If all the deep areas are permanently closed, the shallowest section of the well subject to completion must be used to determine the classification of the well that will be subject to a temporary closure.

§§2. *Notice of the start of the work*

281. The holder of a temporary closure authorization must, at least 7 days before, notify the Minister of the start of the work.

The work is deemed to have started as soon as the first step provided in the work schedule is initiated.

§§3. *Conditions of exercise*

282. The authorization holder must comply with the technical program.

The holder may modify the program by sending to the Minister a supplementary agreement signed and sealed by an engineer stating the nature of the modification and the reasons justifying it. The supplementary agreement must be sent to the Minister before carrying out the work covered by the agreement. If it is urgent to modify the technical program for safety or work quality purposes, the holder must immediately send the agreement to the Minister and justify the urgency.

283. The authorization holder must, within 3 months after the granting of the authorization, complete the temporary closure work.

284. Before starting the temporary closure work, the authorization holder must carry out a pressure and leak test of the casing at a pressure of 7 MPa.

The holder must also, if production tubing is installed, carry out a pressure and leak test of the tubing and annular spaces at a pressure of 7 MPa.

The tightness is confirmed if the stabilized pressure is at least 90% of the pressure applied over a minimum interval of 10 minutes.

If the wellhead configuration does not allow pressure and leak tests, a visual observation carried out with a one-time measurement of leakage may be carried out.

285. The authorization holder must, if the measurements may be carried out without risk to the integrity of the well, measure the shut-in pressures in all annular spaces and in the production tubing.

286. The authorization holder who temporarily closes a well must ensure

(1) that the facilities and equipment installed in the well are compatible with what is planned in the permanent well or reservoir closure and site restoration plan;

(2) that the facilities and equipment installed in the well are durable and corrosion-resistant;

(3) the absence of communication of fluids between the geological formations;

(4) the absence of leaks in joints and welds of the surface casing blowhole;

(5) that the valve on the surface casing blowhole pipe is open and the blowhole is not blocked;

- (6) to install a hemispherical head plug or a blind flange with a needle valve to read the flow at each outlet of the wellhead, except the surface casing blowhole;
- (7) to disconnect, if applicable, the wellhead flow pipe; and
- (8) to chain and lock the valves or remove the handles.

287. While performing the work, the authorization holder must use a wellhead or a blowout prevention system comprising at least 2 different sealing mechanisms as long as there is a risk of fluid kicks.

Despite the first paragraph, the use of a wellhead is not required if no perforation has been carried out and if the well is not an open-hole well. In that case, the holder may weld a steel plate directly on the production tubing. The plate must however permit the taking of pressure measurements in the well.

288. The blowout prevention system and the wellhead must be designed to withstand the maximum pressures provided for in the technical program.

289. The authorization holder must verify daily the blowout prevention system to make sure it works well. If a system component is defective, work must be suspended until the component is repaired.

290. The authorization holder must regularly inspect joints and structural elements of any equipment used to control the pressure to ensure the safe operation of the equipment.

The holder keeps and maintains a register of those inspections and maintains it until the end of the work for the permanent closure of the well.

291. The authorization holder who observes the presence of an emanation at the surface casing blowhole using a bubble point test must also measure the emanation flow over a 24-hour period.

292. The authorization holder must, except for a well whose risk potential has been classified as low under Schedule 4, draw out the polished drill-stem from the well if it is connected to a pumpjack.

293. In the case of a well whose risk potential has been classified as moderate under Schedule 4, the authorization holder must

- (1) install, at the bottom of the hole, a blow-out preventer valve and a casing plug or a support plug; and
- (2) fill the well with non-saline water or with a corrosion inhibiting fluid; an anti-freeze fluid must also protect at least the first 2 m below the surface.

294. In the case of a well whose risk potential has been classified high under Schedule 4, the authorization holder must close the well in accordance with the generally recognized best practices.

295. At the end of the work, the authorization holder must protect the wellhead with a protective fence solidly anchored in the ground, having a perimeter of at least 12 m and a height of at least 2.5 m.

The installation must include a gate with a lock permitting access to the wellhead for monitoring and inspection purposes.

The land must have been leveled around the well.

§§4. *Daily report and completion report*

296. The authorization holder must draw up a daily report of the work and keep it on the activity site.

The daily report must contain all the elements applicable to the declared day including, in particular,

- (1) the number of the temporary closure authorization;
- (2) a description, in chronological order, of the work carried out and the time required for carrying out each step;
- (3) the petroleum or water traces detected;
- (4) the type of pump used for the cementing and its capacity;
- (5) in the case of any cement plugs, the type of cement used, its density, its additives and their proportions, the setting time and the volume used;
- (6) the well loggings carried out;
- (7) if applicable, the results of pressure and leak tests;
- (8) the working condition of the blowout prevention system;
- (9) the composition, concentration and a detailed assessment of all the products stored and used on the site;
- (10) the volume and composition of the gas used, released, incinerated or burnt at the flare;
- (11) the operational problems encountered and the corrective measures taken or planned;
- (12) the indication of any event that disrupted the planned progress of the work; and
- (13) any other information or document deemed necessary by the Minister .

297. The authorization holder must send to the Minister, within the period provided for in section 100 of the Act, a completion report signed by an engineer including, in particular,

- (1) the number of the temporary closure authorization;
- (2) the name and contact information of the licence holder;
- (3) the start and end dates of the work;
- (4) a summary of the work carried out according to the chronological order;

- (5) a comparative analysis of the work carried out compared to the work provided for in the technical program;
- (6) an analysis of the efficiency of the temporary closure;
- (7) the interpreted well loggings, re-set in actual vertical depth and the corrections made;
- (8) a longitudinal section of the well after the temporary closure indicating, in particular,
 - (a) the mechanical conditions of the well after the closure; and
 - (b) the other equipment installed or dropped in the well and not recovered;
- (9) the classification of the well determined according to Schedule 1 ;
- (10) the type of plugs used and the depth intervals of each plug;
- (11) in the case of the cement plugs, the type of cement used, its density, its additives and their proportions, the setting time and the volume used;
- (12) the verified position of each of the plugs; and
- (13) the completed annual inspection worksheet provided for in Schedule 2.

§§5. *Annual inspection*

298. After the temporary closure of the well, the drilling authorization holder must

- (1) inspect the well annually and complete the annual inspection worksheet provided for in Schedule 2; the holder sends the grid to the Minister not later than 31 December of each year;
- (2) ensure that the well does not present risks within the meaning of the second paragraph of section 18; and
- (3) carry out the program for the regular preventive maintenance of the well and the wellhead.

§2. *Permanent closure authorization*

§§1. *Conditions for obtaining an authorization*

299. A well whose risk potential has been classified as low under Schedule 4 and that has been temporarily closed for 20 years must be closed permanently.

A well whose risk potential has been classified as moderate or high under Schedule 4 and that has been temporarily closed for 10 years must be closed permanently.

The Minister may however grant an additional time period if the drilling authorization holder demonstrates to the Minister that the well is safe and that it is necessary to leave it temporarily closed.

300. A licence holder who wishes to obtain a permanent well closure authorization must apply to the Minister, in writing, at least 30 days before the start of the work.

301. The application must contain

- (1) the name and contact information of the holder and the licence number;
- (2) the name of the well;
- (3) if the permanent closure is carried out for a well temporarily closed, the annual inspection worksheet provided for in Schedule 2; and
- (4) any other information or document requested by the Minister.

The application must be accompanied by payment of the fee of \$2,677.

302. Before ruling on the application for permanent closure, the Minister may, if the Minister deems it necessary, require that the licence holder carry out a cement test in a laboratory. The test must comply with the Industry Recommended Practice, IRP: # 25, Primary Cementing, published by the Drilling and Completion Committee.

The holder sends the results of the test to the Minister.

§§2. *Time periods and notice of the start of the work*

303. The authorization holder must, at least 7 days before, notify the Minister of the start of the work.

Where the holder cannot comply with the date, the holder must as soon as possible notify the Minister, in writing, indicating the reasons justifying the delay. The holder must also notify the Minister, in writing, of the new expected date for the start of the work if the date is expected within 7 days of the first notice of delay or of the holder's intent not to proceed.

The work is deemed to have started as soon as the first step provided in the work schedule included in the permanent well or reservoir closure and site restoration plan is initiated.

§§3. *Conditions of exercise*

304. The authorization holder must comply with the permanent well or reservoir closure and site restoration plan.

305. The authorization holder who closes permanently a well must ensure

- (1) the absence of communication of fluids between the geological formations;
- (2) the absence of leaks;
- (3) the absence of excessive pressure in the entire well;

(4) the long-term integrity of the well, while considering the petroleum development potential of the adjacent sector and the impact of the activities that may be carried out in the future; and

(5) the use of durable and corrosion-resistant facilities and equipment.

306. The authorization holder may close on the surface after closure underground.

307. While performing the work for permanent closure, the authorization holder must use a wellhead or a blowout prevention system comprising at least 2 different sealing mechanisms as long as there is a risk of fluid kicks.

308. The wellhead and the blowout prevention system must be designed to withstand the maximum pressure planned in the permanent well or reservoir closure and site restoration plan.

309. The authorization holder must verify daily the blowout prevention system to make sure it works well. If a system component is defective, work must be suspended until the component is repaired

310. The authorization holder must regularly inspect joints and structural elements of any equipment used to control the pressure to ensure the safe operation of the equipment.

The holder keeps and maintains a register of those inspections until the end of the work.

311. The authorization holder must not install a cement plug in a section of the drill hole that does not have a casing, except if the drilling is vertical and the well risk is classified as low under Schedule 4.

312. During the operations for the preparation and installation of cement plugs, the authorization holder must comply with the Industry Recommended Practice, IRP: # 25, Primary Cementing, published by the Drilling and Completion Committee.

313. The cement used must reach a minimum compressive strength of 3,500 kPa after 36 hours of hardening at the temperature of the shallowest formation to be covered.

The authorization holder must restrict the cement shrinkage process and limit to the minimum the risk of formation of a micro-annular space.

314. As of the moment at which the cement has developed a gel strength and until the minimum compressive strength has been reached, the authorization holder must not carry out work that could compromise the integrity of the cement and the holder must comply with the Industry Recommended Practice, IRP: # 25, Primary Cementing, published by the Drilling and Completion Committee.

315. The authorization holder must verify the position of the top of each of the cement plugs.

316. The authorization holder must cut the casings and guide tube at 1 m below the surface.

Where it is justified by agricultural activities, the holder may, with the Minister's authorization, cut the casings and the guide tube at 1.6 m below the surface.

317. The authorization holder must weld a ventilated steel cover at the top of the casings.

318. As soon as the permanent closure work ends, the authorization holder must mark the well with a steel plate at least 150 mm wide and 300 mm high indicating, in relief, the name of the well and its geographical coordinates.

The plate must be fixed 1.5 m above the surface of the ground using a metal rod welded to the outside casing of the well. Where it is justified by agricultural activities, the holder may, with the Minister's authorization, position the plate as close as possible to the well and indicate the azimuth and the distance at which the well is located.

§§4. *Daily report and completion report*

319. The authorization holder must draw up a daily report of the work and keep it on the activity site.

The daily report must contain all the elements that are applicable to the declared day including, in particular,

- (1) the number of the permanent closure authorization;
- (2) a description, in chronological order, of the work carried out and the time required to carry out each step;
- (3) the petroleum or water traces detected;
- (4) the type of pump used for the cementing and its capacity;
- (5) the type of cement used, its density, its additives and their proportions, the setting time and the volume used;
- (6) the well loggings carried out;
- (7) the results of the pressure and leak tests;
- (8) the working condition of the blowout prevention system;
- (9) the operational problems encountered and the corrective measures taken or planned;
- (10) the composition, concentration and a detailed assessment of all the products stored and used on the site;
- (11) the volume and composition of the gas used, released, incinerated or burnt at the flare;
- (12) the indication of any event that disrupted the planned progress of the work; and
- (13) any other information or document deemed necessary by the Minister .

320. The authorization holder must send to the Minister, every Monday, the daily reports of the preceding week until the end of the work. If the Monday is a holiday, the report is sent on the first working day that follows.

321. The authorization holder must send to the Minister, within the period provided for in section 100 of the Act, a completion report signed by an engineer including, in particular,

- (1) the number of the permanent closure authorization;
- (2) the name and contact information of the licence holder;
- (3) the start and end dates of the work;
- (4) a summary of the work carried out according to the chronological order;
- (5) the classification of the well determined according to Schedule 1;
- (6) the type of device used and its specifications;
- (7) the demonstration of the absence of petroleum emanation at the surface casing blowhole before the underground closure work and, if applicable, the demonstration of the absence of petroleum emanation in the casings before the closure on the surface;
 - (8) the data, recordings and results of the pressure and leak tests and their interpretation;
 - (9) a demonstration of the quality of the cement bond behind the casing before the work;
 - (10) the method for cleaning the well used before the installation of the plugs;
 - (11) in the case of the cement plugs used,
 - (a) the type of cement used, its density, its additives and their proportions, its setting time and the volume used;
 - (b) the method for installing the plugs;
 - (c) the verified position of each of the plugs; and
 - (d) if laboratory testing has been done on the cement after the granting of the authorization, the properties of the cement determined in the laboratory;
 - (12) the nature of the fluid used to fill the space between each plug;
 - (13) the cutting depth of the casings and guide tube below the surface;
 - (14) a photograph of the ventilated steel plate welded at the top of the casings before the backfilling;

(15) a longitudinal section of the well after the permanent closure, according to the measured depth and the actual vertical depths signed and sealed by an engineer, indicating, in particular,

- (a) groups, geological formations, lithological contacts and faults including, in particular,
 - i. the usable groundwater;
 - ii. thermal anomalies;
 - iii. the coal beds exceeding 300 mm in thickness;
 - iv. the permeable and porous areas having an effective porosity greater than 1% in a terrigenous bedrock and greater than 3% in a carbonate bedrock;
 - v. the formations that can potentially produce petroleum and those that produce petroleum;
 - vi. the layers of abnormal pressure; and
 - vii. the areas of circulation loss;
- (c) the location of each of the casings and of the guide tube;
- (d) the depth interval of an open-hole well;
- (e) the type of plugs used and the depth intervals of each plug; and
- (f) the other equipment installed or dropped in the well and not recovered;

(16) a comparative analysis of the work carried out compared to the work provided for in the permanent well or reservoir closure and site restoration plan;

(17) a plan of the layout of the site after the restoration work; and

(18) photographs of the entire site restored.

DIVISION II

PERMANENT WELL OR RESERVOIR CLOSURE AND SITE RESTORATION PLAN

§1. Content of the plan

322. The permanent well or reservoir closure and site restoration plan must be signed and sealed by an engineer and must contain, in particular,

- (1) the name and contact information of the licence holder and the licence number;
- (2) the proposed name of the well;
- (3) the classification of the well determined according to Schedule 1 ;

- (4) the name and contact information of the engineer responsible for the permanent well or reservoir closure and site restoration plan;
- (5) the name, profession and functions of the persons who prepared or revised the plan;
- (6) a description and photographs of the condition of the site before the drilling;
- (7) the method used to demonstrate that, prior to the permanent closure of the well or reservoir, no emanation at the surface vent has been observed over a period of 24 hours and no gas migration;
- (8) a chronological and detailed description of the work carried out;
- (9) the work schedule;
- (10) a broken down estimate of the cost of the work;
- (11) a description of the condition of the well including, in particular, the cemented, perforated and open-hole depths;
- (12) the cement evaluation method to show the uniform coverage of the cement behind the casing before the work;
- (13) the type of service device and equipment to be used and their specifications;
- (14) a longitudinal section of the well indicating, in particular,
 - (a) the technical elements;
 - (b) the depth intervals that will be protected or isolated; and
 - (c) the geological formations including, in particular,
 - i. the usable groundwater;
 - ii. the thermal anomalies;
 - iii. the coal beds exceeding 300 mm in thickness;
 - iv. the formations that can potentially produce petroleum and those that produce petroleum;
 - v. the layers of abnormal pressure;
 - vi. the areas of circulation loss; and
 - vii. the permeable and porous areas having an effective porosity greater than 1% in a terrigenous bedrock and greater than 3% in a carbonate bedrock;
- (15) the method for cleaning the well used before the installation of the plugs;
- (16) the type of plugs used and the depth intervals of each plug;

(17) a cementing program complying with the Industry Recommended Practice, IRP: # 25, Primary Cementing, published by the Drilling and Completion Committee indicating, in particular,

(a) for each cement plug, the type of cement used, its density, its additives and their proportions, the setting time, calculated volume and surplus percentage;

(b) the method for installing the plugs;

(c) any required changes to the cement used for the plugs due to specific physical and chemical conditions of the environment, including, in particular, the depth of the well, a horizontal well, an abnormal pressure or temperature, a salt area or a corrosive environment; and

(d) the nature of the fluid used to fill the space between each plug;

(18) the method used to demonstrate that following the installation of the plugs and before the cutting of the casings and the guide tube at the surface, there was no gas emanation;

(19) a plan showing the extent of the activity site;

(20) a chronological and detailed description of the restoration work to maintain the natural landscapes, minimize impact on wildlife, and harmonize the site with the use of the territory including, in particular,

(a) the removal of the rat and mouse holes;

(b) the levelling of the ground around the well;

(c) the draining of the retention ponds;

(d) the filling or levelling of the ponds;

(e) the rehabilitation of contaminated land;

(f) the purge of pipes;

(g) the withdrawal of the equipment and facilities; and

(h) revegetation;

(21) a plan modelling the work described in subparagraph 20;

(22) the surface drainage after the work; and

(23) a follow-up program for the integrity of the well during the closure and site restoration work.

If certain elements required in the first paragraph are unknown when the holder submits the plan to the Minister in accordance with section 101 of the Act, those elements will have to be provided when the plan is revised.

323. During the revision of the plan, the authorization holder must use the number and name of the well as they appear on the drilling authorization.

§2. Guarantee

324. The guarantee provided for in section 103 of the Act must be furnished to the Minister in any of the following forms:

- (1) a cheque made to the order of the Minister of Finance;
- (2) bonds issued or guaranteed by Québec or another province of Canada, by Canada or by a municipality in Canada, and having a market value at least equal to the amount of the guarantee exigible; registered bonds must be submitted with a power of attorney on behalf of the Minister of Finance and, where applicable, with a resolution authorizing the person who signs the power of attorney;
- (3) guaranteed investment certificates or term deposit certificates, in Canadian dollars, issued on behalf of the Minister of Finance by a bank, a savings and credit union or a trust company; deposit certificates must have a term of at least 12 months, be automatically renewable until the declaration of satisfaction of the Minister or the certificate of release under sections 112 and 114 of the Act and not include any restriction in respect of redemption during its term;
- (4) an irrevocable and unconditional letter of credit issued on behalf of the Gouvernement du Québec by a bank, a savings and credit union or a trust company;
- (5) a security or a guarantee policy issued on behalf of the Gouvernement du Québec by a legal person legally empowered to act in that capacity;
- (6) a trust constituted in accordance with the Civil Code and meeting the following requirements:
 - (a) the purpose of the trust is to ensure the performance of the work provided for in the permanent well or reservoir closure and restoration site plan pursuant to sections 101 to 115 of the Act;
 - (b) the Minister of Finance and the licence holder referred to in section 101 of the Act are joint beneficiaries of the trust;
 - (c) the trustee is a bank, a savings and credit union or a trust company;
 - (d) the trust patrimony is comprised only of sums in cash, or of bonds or certificates of the same type as those listed in subparagraphs 2 and 3.

The financial institutions referred to in subparagraphs 3, 4 and 6 of the first paragraph must be empowered by law to carry on the activities provided for in those subparagraphs.

The guarantees referred to in subparagraphs 1 to 3 of the first paragraph are received on deposit by the Minister of Finance pursuant to the Act respecting deposits with the Bureau général de dépôts pour le Québec (chapter D-5.1).

325. In the case of a guarantee furnished according to subparagraph 3 or 6 of the first paragraph of section 324, the contract constituting the guarantee must provide the following conditions:

(1) the purpose of the guarantee is to ensure the performance of the work provided for in the permanent well or underground reservoir closure and site restoration plan pursuant to sections 101 to 115 of the Act;

(2) no person may make withdrawals or be reimbursed without having obtained the Minister's satisfaction provided for in sections 112 and 114 of the Act or a reduction of the guarantee according to section 108 of the Act; the prohibition also applies to any form of compensation that could be made by the bank, the savings and credit union, the trust company or the trustee;

(3) where the second paragraph of section 111 of the Act applies, the payment of the guarantee is payable at the Minister's request;

(4) the bank, the savings and credit union, the trust company or the trustee provides the Minister with the information it possesses concerning the contract;

(5) in case of dispute, the courts of Québec are the sole competent courts;

(6) in the case of a trust:

(a) the trustee must be domiciled in Québec;

(b) the trustee sees to the management of the trust at the expense of the settlor or of the licence holder referred to in section 101 of the Act;

(c) the trust terminates

i. when the Minister issues the certificate of release under sections 112 and 114 of the Act or when it is replaced by another guarantee complying with the requirements of this Regulation;

ii. when the Minister acts on the condition provided for in subparagraph 3 of the first paragraph of this section.

The licence holder referred to in section 101 of the Act must submit to the Minister a certified copy of the original contract.

326. In the case of a trust, interest yielded by the trust patrimony belongs to the trust. Interest kept as part of the trust patrimony must not be used as payment of the guarantee.

327. The purpose of the irrevocable and unconditional letter of credit provided for in subparagraph 4 of the first paragraph of section 324, of the security or guarantee policy provided for in subparagraph 5 of the first paragraph of that section is to guarantee payment of the cost of the work where the obligations of sections 101 to 115 of the Act are not met. The contract must have a term of at least 12 months and must include clauses providing the following conditions:

(1) in the case of non-renewal, termination, revocation or cancellation, the guarantor must notify the Minister at least 60 days before the date fixed for the expiry, termination, revocation or cancellation of the guarantee;

(2) in the case of non-renewal, termination, revocation or cancellation, the guarantor remains responsible, where the obligations of sections 101 to 115 of the Act are not met, for the payment of the cost of the work involved for the permanent well or underground reservoir closure and site restoration carried out before the date of expiry, termination, non-renewal or revocation up to the amount covered by the letter of credit, the security or guarantee policy. That responsibility must hold until the issue of the certificate of release provided for in sections 112 and 114 of the Act, unless the person in question has deposited an alternative guarantee or the guarantor has deposited the amount covered by the letter of credit, the security or guarantee policy in a trust that complies with this Regulation where the Minister of Finance and the guarantor are joint beneficiaries;

(3) where applicable, the obligation is solidary, with a waiver of the benefits of discussion and division;

(4) the guarantor consents to the Minister's being able at any time after the sending of a notice of 60 days to make changes to the permanent well or underground reservoir closure and site restoration plan and waives pleading against the Minister any ground of defence pertaining to the content of the plan;

(5) where the second paragraph of section 111 of the Act applies, payment of the guarantee is exigible at the Minister's request;

(6) in the case of dispute, the courts of Québec are the sole competent courts.

The licence holder referred to in section 101 of the Act must submit to the Minister a certified copy of the original contract.

328. The guarantee furnished may be replaced at any time by another guarantee that complies with the requirements of this Regulation.

§3. *Fees payable*

329. The fee payable for the assessment of a permanent well or reservoir closure and site restoration plan is \$1,309.

The fee payable for the assessment of a revision of a permanent well or reservoir closure and site restoration plan is \$654.

330. The fee payable for the assessment conducted for the purpose of issuing a certificate of release under section 112 of the Act is \$587.

The fee payable for the inspections conducted for the purpose of issuing a certificate of release under the first paragraph is \$996 per inspection.

CHAPTER XV

FEE PAYABLE FOR A NOTICE OF NON-COMPLIANCE, MONETARY ADMINISTRATIVE PENALTIES AND OFFENCE

DIVISION I

FEE PAYABLE FOR A NOTICE OF NON-COMPLIANCE

331. The fee payable by a person to whom an inspector submitted a notice of non-compliance with the provisions of the Act or this Regulation is \$500.

DIVISION II

MONETARY ADMINISTRATIVE PENALTIES

332. A monetary administrative penalty of an amount provided for in section 187 of the Act may be imposed on any person who contravenes any of sections 4, 5, 24, 28, 29, the first paragraph of section 35, sections 36, 37, 39, 43, 49 to 51, the first paragraph of section 59, sections 60, 61, 63 to 67, the first paragraph of section 75, sections 76, 77, 80, 103, 104, the first paragraph of section 105, section 106, the first and second paragraphs of section 107, sections 108, 117 to 119, 127 to 129, 132, 160, 161, the first paragraph of section 162, section 163, the first and second paragraphs of section 164, sections 165, 168 to 170, the first paragraph of section 176, sections 177, 190, 191, the first paragraph of section 198, sections 199, 214, 215, the first paragraph of section 223, sections 224, 231, 232, 238, 242 to 244, 249, 250, 255, 261, 262, 264, 270, the first paragraph of section 281, section 296, the first and second paragraphs of section 303, sections 319, 320 and 323.

333. A monetary administrative penalty of an amount provided for in section 188 of the Act may be imposed on any person who contravenes any of sections 19, 22, 26, the first paragraph of section 27, sections 30, 38, the first and second paragraphs of section 40, sections 41, 42, 47, 48, 62, 78, the first paragraph of section 81, sections 82 and 83, paragraphs 1 and 3 of section 84, sections 85 to 99, the first paragraph of section 100, the first and second paragraphs of section 101, paragraph 2 of section 102, section 109, the first paragraph of section 110, section 111, the first paragraph of section 112, sections 113 to 116 and 130, the first paragraph of section 133, sections 134 and 135, paragraphs 1 and 3 of section 136, section 137, the second paragraph of section 138, sections 139 to 147, subparagraphs 1, 3 and 4 of the first paragraph of section 149, sections 150 to 156, the first paragraph of section 157, the first and second paragraphs of section 158, paragraph 2 of section 159, sections 166, 167, 171, 178, the first paragraph of section 179, the first paragraph of section 181, section 182, paragraphs 3 and 4 of section 183, sections 184 to 188, 200, the first paragraph of section 201, section 202, the first paragraph of section 205, the first paragraph of section 206, sections 207 to 211, 225, 227 to 230, 234, 236, the first paragraph of section 239, section 240, paragraph 2 of section 241, sections 245 and 246, the first and second paragraphs of section 247, sections 248, 251 to 253, 256, 263, 265, 275, 282, 283, the first, second and fourth paragraphs of section 284, paragraphs 4 to 8 of section 286, sections 287 to 295 and 298.

334. A monetary administrative penalty of an amount provided for in section 189 of the Act may be imposed on any person who contravenes any of sections 7, 8, 10, 11, the first paragraph of section 14, section 15, the first and second paragraphs of section 17, the first paragraph of section 18, sections 20, 21, 44 to 46, 53, 54, 212, 213, 217 and 218.

DIVISION III
OFFENCE

335. Every person who contravenes any provision of this Regulation commits an offence and is liable to the fine provided for in paragraph 2 of section 199 of the Act.

CHAPTER XVI
TRANSITIONAL AND FINAL

DIVISION I
TRANSITIONAL PROVISIONS MADE UNDER SECTION 287 OF THE ACT

336. The authorization to produce brine referred to in the first paragraph of section 272 of the Act is deemed to be issued for each of the wells for which the holder has started to produce brine on (*insert the date of coming into force of this section*).

337. A permanent well closure authorization issued under the Mining Act in force on (*insert the date of coming into force of this section*) is deemed to be a permanent closure authorization issued under the Act.

If on (*insert the date of coming into force of this section*) the work for the permanent closure has not started, the authorization holder must provide to the Minister, in accordance with section 275 of the Act, the permanent well or reservoir closure and site restoration plan and the guarantee before starting the work.

If on (*insert the date of coming into force of this section*) the work for the temporary closure is started but not completed, the authorization holder is not required to provide to the Minister the permanent well or reservoir closure and site restoration plan and the guarantee provided for in section 275 of the Act. The holder must complete the work in accordance with the closure program submitted to the Minister under section 59 of the Regulation respecting petroleum, natural gas and underground reservoirs (chapter M-13.1, r. 1). The work must be completed not later than 1 year after (*insert the date of coming into force of this section*).

338. For the purposes of section 275 of the Act, the Minister keeps the performance guarantee submitted to the Minister under section 16 of the Regulation respecting petroleum, natural gas and underground reservoirs until the Minister has received the restoration plan and the guarantee provided for in Chapter IV of the Act.

DIVISION II
FINAL

339. This Regulation comes into force on the fifteenth day following the date of its publication in the *Gazette officielle du Québec*.

SCHEDULE 1**CLASSIFICATION OF WELLS**

The classification of wells must include

1. the fluids in the well;
2. its type;
3. its role;
4. its status;
5. its direction;
6. the abundance of fluids.

Fluids in the well	Oil, gas, condensate, bitumen, CO ₂ , H ₂ S, water, brine, water vapour, sulphur, non-combustible gas or gas hydrates
Type of well	Exploration or production, based on the licence held by the drilling authorization holder
Role of the well	Well use
Producing	Well used to extract petroleum or brine from a pool
Injecting	Well used to inject fluids in an underground formation to enhance petroleum recovery
Cyclical	Well used for the production and injection, alternately, on a regular basis
Service - supply	Well used to collect the fluids necessary for the production or injection operations
Service - storage	Well used for the injection and withdrawal of substances determined in the Regulation respecting petroleum exploration, production and storage licences, made by Order in Council XXXX-XXXX dated (<i>insert the date of the Order in Council</i>)
Service – disposal	Well used as permanent location to store discharges in the reservoir
Service - relief	Well used to intercept another well that is blowing out
Observation	Well used to monitor the conditions of one or more geological formations, to determine the decline characteristics of a reservoir or to monitor the other wells of a reservoir
No role currently	Well not fulfilling any role
Other	Well having another unidentified role
Status of the well	State of the well at a given point in time
On hold	Well for which a drilling authorization application has been filed, but the drilling authorization has not yet been granted
Planned drilling	Well for which a drilling authorization has been granted, but whose drilling work has not yet been deemed to have started
Activity underway	Well whose authorized work is underway
Production	Well whose fluids are extracted from the drill hole
Injection	Well whose fluids are pumped into the drill hole

Production and injection	Well that produces and in which fluids are injected, alternately, in the drill hole
Temporary interruption (<i>shut-in</i>)	Well in which work is interrupted for a short period, between 2 activities or 2 operations
Temporarily closed	Well that has been temporarily closed
Permanently closed	Well that has been permanently closed
Restored	Well that has been permanently closed and whose work site has been restored
Cancelled	Well whose drilling authorization is revoked or expired
Other	Well that has another unidentified status
Direction of the well	Vertical, directional or horizontal
Abundance of fluids	Primary, secondary, indication or trace

SCHEDULE 2

ANNUAL INSPECTION WORKSHEET

**Énergie et Ressources
naturelles**
Québec

Direction du bureau des hydrocarbures
5700, 4e avenue ouest bureau A-422
Québec (Québec) G1H 6R1
Télécopieur : 418-644-1445

ANNUAL INSPECTION WORKSHEET TEMPORARILY CLOSED WELL OBSERVATION WELL

Date received by the
Department

IDENTIFICATION					
Well number		Licence holder		Expiry of the licence	YYYY/MM
Well name		Licence number		Date of inspection	YYYY/MM/DD
Location of the well (NAD83 DD MIN SEC)				Time start of inspection	
Latitude N		Longitude W		Time end of inspection	YYYY/MM/DD
Date of temporary closure, if applicable					
INTERVENING PARTIES					
Name		Position		Company	
					Tel. or email
SITE SAFETY – The perimeter of the well is protected.					
A sign at the entrance of the site indicates the location of the well, the name of the holder, the licence number, the name of the well, the well number, the telephone number in case of emergency and pictograms associated with dangerous products.					
The wellhead is surrounded by a protective fence having a perimeter of at least 12 metres and a height of at least 2.5 metres.					
The fence is solidly anchored in the ground.					
The installation includes a gate with a lock permitting access to the wellhead.					
The protection measures implemented around the well are efficient.					
STATE OF THE PREMISES – Safety and environment					
The geographical coordinates are accurate and allow easy location of the well.			The site is free of residual materials.		
The access leading to the well is tidy and safe.			The site is free of dangerous goods.		
The premises are free of brush that may cause a fire.			An indication of migration of gas in the soil is observed.		
The layout of the equipment around the well is limited.			A test of gas migration in the soil has been carried out.		
The land around the well is leveled.			The test results confirm gas migration in the soil.		
The state of the premises is safe for persons and property, and environmental protection.					
WELLHEAD – The integrity					
A wellhead is present.			A surface casing blowhole is present.		
All valves are chained and locked or the handles have been removed.			The surface casing blowhole valve is open.		
The wellhead is free of corrosion or erosion.			The surface casing blowhole is blocked.		
The wellhead is designed to withstand the measured pressure.			Insert the flow measured at the surface casing blowhole (with the unit).		
The flow pipe is disconnected from the wellhead.			Insert the concentration of gas at the blowhole of the casing (with the unit)		
Each outlet is equipped with a plug or a blind flange with a needle valve to read the flow, except on the surface casing blowhole.			The emanation is only composed of gas.		
A leak is observed in the guide tube.			Indicate the composition of the fluid at the blowhole.		
			There is a leak on the blowhole joints and welds.		
The wellhead is intact and safe for persons and property, and environmental protection.					
ANNUAL MONITORING OF THE PRESSURE - If applicable, enter the pressures in kPa in all the annular spaces and in the production tubing.					
Pressure of the production casing:		Pressure of the intermediate casing:		of the surface casing:	
Pressure of the production tubing: Are the pressures constant with respect to the last measurements?					
REGULAR PREVENTIVE MAINTENANCE – Minimum frequency of 3 or 5 years (refer to the Regulation to determine the frequency associated with each well)					
Insert the date of the last regular preventive maintenance.		YYYY/MM		The joints are leakproof.	
Maintenance has been carried out during the inspection.				The valves are in good condition.	
Insert the date planned for the next maintenance.		YYYY/MM		If repairs are required, indicate the nature of the repairs and the date planned for the work.	
SPECIFIC VERIFICATIONS AT THE WELL (critical elements, validation of compliance for engineering, etc.)					
ADDITIONAL INFORMATION					
INSTRUMENTATION – Specify the tools used for the inspection (flow meter, gas detector, etc.)					
APPENDICES - Attach at least a photograph of the protected perimeter of the well and an overall photograph of the wellhead.					
Type of document		Name of document		Description of content	Number of pages
DECLARATION - Confirmation of the validity of the information contained in the report					
Name		Signature		Tel. and email	Date
Inspector:					
Inspector:					
Approver:					

SCHEDULE 3**CASING INTEGRITY INSPECTION PROCEDURE**

The holder must select 1 of the following 2 procedures to determine the integrity of the casings:

1. pressure test;
2. inspection logging.

If the holder chooses to carry out a pressure test and an inspection logging, the results of the pressure test prevail.

1. Pressure test

A holder who chooses to carry out a surface or intermediate casing pressure test must proceed as follows:

1.1. Surface casing pressure test

If only 1 surface casing is installed, the minimum pressure to apply to the surface, in kPa, is a factor of 2.5 multiplied by the expected final depth of the drill hole in actual vertical depth.

If an intermediate casing is expected to be installed, the minimum pressure to apply to the surface, in kPa, is a factor of 2.5 multiplied by the expected depth for the installation of the intermediate casing in actual vertical depth.

The pressure to be applied to the surface is calculated by assuming that the density of the fluids in the drill hole is 1,000 kg/m³. At the time the pressure test is carried out, the holder must adjust the pressure to be applied according to the density of the fluids present in the drill hole.

1.2. Intermediate casing pressure test

If an intermediate casing is installed, the minimum pressure to be applied to the surface is a factor of 0.67 multiplied by the pressure measured at the depth of the installation of the intermediate casing. If that pressure has not been measured, the holder must estimate it from the real or theoretical pressure gradient that is 11 kPa/m of actual vertical depth.

The pressure to be applied to the surface is calculated by assuming that the fluids in the drill hole have a density of 1,000 kg/m³. At the time the pressure test is carried out, the holder must adjust the pressure to be applied according to the density of the fluids present in the drill hole.

2. Inspection logging

The holder who chooses to carry out a logging or a combination of inspection loggings of the surface casing or the intermediate casing must interpret the data from one joint to the other in order to

- detector holes, perforations, cracks, metal losses and metal thickness;
- determine the percentage of penetration of the anomalies.

2.1. Surface casing inspection logging

The maximum bursting strength, based on the specified minimum yield strength of the casing and the lowest value obtained from the metal thickness, must be equal to or greater than a factor of 2.5 multiplied by the expected final depth of the drill hole in actual vertical depth. The following equation must be resolved:

$$P_v - \frac{(2Y_p t)}{D} \geq 2.5 \times \text{expected final depth of the drill hole in actual vertical depth}$$

where:

P_v = minimum internal yield pressure (kPa)

Y_p = specified minimum yield strength (kPa)

t = reduced thickness of the metal (mm)

D = nominal outside diameter (mm)

2.2. Intermediate casing inspection logging

The maximum bursting strength, based on the specified minimum yield strength of the casing and the lowest value obtained from the metal thickness, must be equal to or greater than a factor of 0.67 multiplied by the formation pressure at the depth of installation of the intermediate casing. The following equation must be resolved:

$$P_v - \frac{(2Y_p t)}{D} \geq 0.67 \times \text{expected final depth of the drill hole in actual vertical depth}$$

where:

P_v = minimum internal yield pressure (kPa)

Y_p = specified minimum yield strength (kPa)

t = reduced thickness of the metal (mm)

D = nominal outside diameter (mm)

SCHEDULE 4**CLASSIFICATION OF A WELL'S RISK POTENTIAL**

Classification of the wells	Type of well	Location	Geology	Status before the temporary closure
Low risk	Gas well < 28,000 m ³ /day Oil well without flow and without H ₂ S Tube well with a content in H ₂ S < 5%, non-perforated	At 150 m or more from a building	Non-problematic geological formations	Non-problematic well Well whose pressures are controlled
Moderate risk	Gas well ≥ 28,000 m ³ /day Oil well without flow and with a content in H ₂ S ≥ 5% Oil well with flow Injection well	At less than 150 m from a building	Problematic geological formations (example: karsts)	Problems documented and not controlled (example: communication between adjacent wells)
High risk	Gas well with a content in H ₂ S ≥ 5% Sour gas well	Not applicable	Not applicable	Not applicable

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